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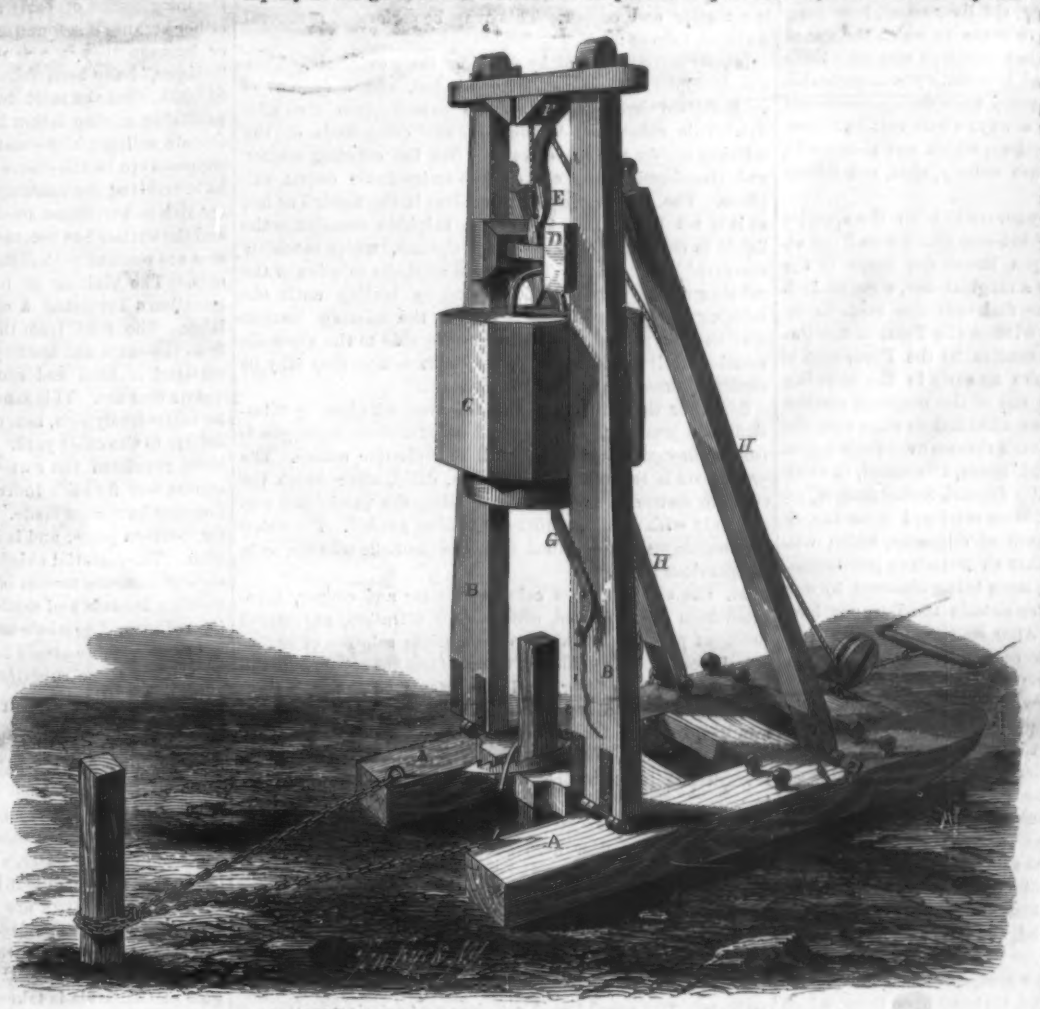
Improved Post Driving Machine.

It is claimed that fence posts which are driven will stand firmer and last longer than those which are set with the spade. Certainly, with proper apparatus, posts may be driven with far less labor than they can be set in dug holes. The one of which the accompanying engraving is a correct representation, appears to be admirably adapted to the requirements of fence building. It is strong and efficient, yet light and portable, and may be used equally well on uneven ground and side hills as on a level.

The bottom is a frame consisting of two runners, A, connected and braced by cross pieces, the forward ends of the runners being beveled for facility in drawing the machine from place to place. To this frame are pivoted the uprights, B, connected at the top by a cross framing. These uprights form the slides for the hammer, C, and guide, D the hammer being a block of wood sufficiently heavy for the purpose, and hooped with iron at its face end. A tripping hook, E, and the inclined face, F, are similar in form and arrangement to those on the ordinary pile driver. To hold the hammer or drop in an elevated position, while the machine is being drawn from place to place, and while a post is being adjusted to be driven, a catch latch, G, is attached to one of the uprights. The drop is raised by horse power, by means of a rope and pulleys, as seen. When the maine is to be moved the staple of the horse's whiffletree is attached to a hook at the forward end of the frame, and a graduated or measuring chain, seen attached to the rear ends of the runners, is passed around the post last driven, and the machine moved until the chain is tightened, when the distance of the posts one from the other is thus measured, and the machine is ready to drive another post. To hold the post, to be driven, in place, two adjustable arms which hook into each other are attached to the yoke at the bottom of the uprights. Their form and operation are readily seen in the engraving. At the back of the uprights are diagonal braces, H, which are pivoted to the uprights at one end, and to the runners at the other. These lower ends may be advanced to or receded from the foot of the uprights, and secured to either one of the series of eyebolts seen on the runners. This will allow the machine to work on uneven ground, or a side hill, while the uprights will remain perpendicular. The inventor claims that the machine will drive posts at equal distances apart as fast as four men can follow up and board.



FITCH'S PATENT FENCE POST DRIVER.

Patented through the Scientific American Patent Agency, May 7, and Nov. 26, 1867, by C. T. Fitch. All letters of inquiry should be addressed to Fitch & Videto, Harbour Creek, Pa.

American Ordnance.

Whatever representations or misrepresentations may have been made on either side of the Atlantic with regard to the performances of American ordnance, it is certain that it comes out very creditably in this respect in the report of the U. S. Chief of Ordnance—General Dyer—just issued. The official facts contained in this report are at once interesting and instructive, and General Dyer demonstrates that the American heavy smooth bores are "the cheapest and most effective gun possessed by any nation."

The report states that the 20-inch gun has been fired with a charge of 200 pounds of powder and a shot weighing 1,100 pounds, and the General states that this may be the regular charge for this gun. The range at 25° elevation was more than four and a half miles. The 15-inch gun, about the performance of which, at Shoeburyness, we in England know something, has been fired as follows:—7 times with 40 pounds of powder and a shell weighing 350 pounds; 5 times with 50 pounds of powder and a shell weighing 350 pounds; 70 times with 50 pounds of powder and a shot weighing 434 pounds; 59 times with 55 pounds of powder, and a shot weighing 435 pounds; once with 60 pounds of powder and a shot weighing 434 pounds; once with 75 pounds of powder and a shot weighing 434 pounds; once with 80 pounds of powder and a shot weighing 434 pounds; once with 90 pounds of powder and a shot weighing 434 pounds; and 125 times with 100 pounds of powder and a shot weighing 434 pounds. The mean range obtained with 100 pounds of powder at an elevation of 22°, was 7,732 yards. The mean initial velocity of the shot with the same charge, was 1,510 feet per second. Ten rounds were fired in 35 minutes, which was as rapidly as the gun could be fired with 100 pounds of powder and a solid shot. An examination of the gun has failed to detect any enlargement of the bore from firing, neither has the metal been cut away by the powder. In fact, the gun is reported to be serviceable in every respect.

If the performances of the 15-inch gun are thus proved to be in every respect satisfactory, no less so are those of the 20-inch gun. This formidable weapon has been fired with 200 pounds of powder and a shot weighing 1,100 pounds, the range at 25° elevation being more than four miles and a half. This gun and its charge are difficult things for us to realize, but here they are, and here are their results, and, what is more, General Dyer has no hesitation in assigning this heavy charge as that which may be regularly used in this gun. However we may argue down the matter in theory, there is no getting over these practical facts, unless we dub General Dyer a fool, and his report a fiction.—*London Mechanics' Magazine.*

Transfusion in Cases of Poisoning.

Hitherto transfusion of healthy blood into the veins of another being was applied only in extreme cases where loss of blood had rendered necessary some desperate means of replacing the loss of red corpuscles and oxygen in the arteries, and restoring respiration and circulation. Quite lately, however, a German and a French physician, Drs. Eulenburg and Landers, have sent to the French Academy a treatise on Transfusion of Blood, in which, by an extended series of experimental researches upon animals, they seek to prove that this process, modified in a certain way, and repeated if necessary, should be viewed as a sovereign mode of treatment in all cases of acute poisoning, viz., of such poisons which, after absorption by the blood, act injuriously upon the vital nervous centers.

The rationale of this theory is given by them as follows: The poisonous substances in question act in this way—they are absorbed into the blood from the stomach or other places of application, and are then carried to those spots in which they exert prominently their deleterious influence (*e. g.*, the *medulla oblongata*, the central organ of respiration and movement of the heart). Once arrived in the blood, these poisons are not to be counteracted by so-called antidotes except in a few cases. In order to produce its effect, however, each poison must be present in a certain quantity, not below some minimum, without which its action on the tissues would not become potent.

Supposing that the blood contained an excess of such poison, it is seen that by removing a portion of this so-to-say saturated solution, and by substituting a proportional quantum of pure blood, the relative quantity of poison would be greatly reduced. By replacing the blood removed, dangers are obviated which might result from its withdrawal. Transfusion in this instance should be viewed as entirely harmless, and may be repeated a number of times, to the total removal of the original supply that had absorbed the poison. In their experiments the authors continued this substitution as long as the symptoms indicated still the presence of poison.

The most successful results were obtained with certain poisonous gases, as carbonic acid, and carbonic oxide. Blood surcharged with carbonic acid causes death under the known phenomena of asphyxia, which are produced in part by the exciting action of the condensed gas, and partly by the simultaneous absence of oxygen. It seems rational to suppose that the best remedy in this case would be to impregnate the blood with oxygen, and to free it at the same time from its excess of carbonic acid. The oxygenated blood for injection used was either arterial and rich in oxygen, or such that had been beaten in the air and turned bright red. Transfusion in this instance proved much more efficacious than artificial respiratory movements, which can only be of use when the heart is yet in action and capable of performing its function of sending the blood from the lungs to the centers. On the contrary, by injecting oxygenated blood through the veins toward the heart, it has been shown by the experiments that the action of the heart, even if reduced to a minimum or even altogether extinguished, could be revived. Similar results were obtained in poisoning by carbonic oxide. There is in this case the aggravating circumstance that this gas when absorbed into the blood takes oxygen from the red corpuscles, rendering them incapable to perform the exchange of gases in the lungs, and that the blood thus, in greater or less measure becomes unfit for respiration. Here it is the corpuscles which are affected and must be replaced, and the truth of this view has already been established by Kuhne in actual cases of poisoning in human subjects and animals.

The experiments instituted to test the method in poisoning by chloroform and ether, as well as by narcotic alkaloids (morphia, strychnia), have given analogous results, the agents being in all cases given in toxical doses.—*Druggists' Circular.*

AN ELECTRICAL CLOCK in the rotunda of the Philadelphia Merchants' Exchange has a running gear of the simplest description, consisting merely of two cog wheels and a ratchet wheel. The driving power is supplied by a weak galvanic battery, the currents from which, transmitted through two galvanometer coils placed one on each side of the clock case, act upon steel bar magnets set within the pendulum ball. The latter swings between the two coils, so that when one of them is "positively charged" the ball is attracted until by contact it becomes similarly electrified, and consequently repelled, then swinging over to the "negative" coil, it becomes negatively charged, again repelled, and thus the vibrations are kept up indefinitely, or as long as the battery continues working. The alternate positive and negative charges are made and broken by a simple slide bar moved by a wire pin on the pendulum rod.

EDITORIAL CORRESPONDENCE.

Rome—Candles—Mass at St. Peter's—Coliseum by Moonlight.

ROME, Feb. 12, 1868.

Upon reaching the frontier, we experienced a tedious delay of upwards of an hour for a change of cars and the examination of passports and baggage. Our trunks were not opened, as our courier had taken the precaution to procure from Rome, in advance, a "*Lascia Passuré*," or "Let Pass," which saves a good deal of bother. Upon signing this document in the presence of the guard, nothing more is demanded. There is no difficulty in entering Rome. All that is now wanted is a passport, which need not be *vised*. The train was filled with Americans, who rush down to Italy to pass the winter months. And here I feel inclined to remark, that it is impossible to travel long in Europe without discovering the existence of a rough fiber in the composition of some of our countrymen, which, though less marked than what one sees in English travelers, is nevertheless the subject of occasional ridicule. For example—one pompous New Yorker, who seems to be "traveling on his muscle," boasted of having knocked down the servant of a family, who was trying to do his duty in keeping some seats for them in a car. Another, impatient of the delay, thrust his head out of the car window and shouted at the top of his lungs: "I say, old liver-sweet, how long have we got to stop here?" in response to which the guard very civilly tried to find out what the man wanted. Such brutality, such coarse impudence is certainly not excusable anywhere; and to presume too much upon the ignorance and forbearance of foreigners is not always a safe rule to follow. These cases, however, are exceptions, which one meets with here; for, as a rule, our people are orderly, civil, and liberal travelers.

One week spent in Rome only serves to whet the appetite for the almost endless objects of interest which crowd the attention. To be in Rome—Pagan Rome, the Rome of the Cesars, Papal Rome—is of itself a magical fact, a grand incident in the life of any one. Our first visit was made to St. Peter's, on Sunday morning, to witness the Feast of the Purification, and the blessing of candles by the Pope—one of the things to be seen. We were up early in the morning and off to St. Peter's to witness one of the grandest ceremonials of the church. Ladies were admitted to seats near the tribune if dressed in black, with veils thrown over their heads. Gentlemen were allowed to stand inside, if dressed, in swallow-tail coats. A guard of gaily dressed Swiss lancers, resembling harlequins in a play, were stationed upon the dividing line, to prevent any breach of etiquette, which was rigidly enforced, as I noticed that an American gentleman, wearing an ordinary frock coat, upon being observed by one of the guards, was invited to step outside the line, not having on the wedding garment. After waiting for upward of an hour, a regiment of soldiers were marched in, and divided, so as to form an open way in the central aisle for the passage of the procession. In a few minutes more, music, proceeding from a side chapel, announced that the Pope was coming, and all eyes turned in that direction. The procession was led by several ecclesiastical dignitaries, richly dressed in robes of gorgeous hues. The Pope, sitting in his grand chair, was borne upon the shoulders of six men, in scarlet gowns, when upon reaching the tribune, His Holiness took his seat upon a throne facing the bronze altar of St. Peter, and looking toward the vast audience. The cardinals—princes, members of the guard, nobles, and other dignitaries of privilege, were all richly clothed, and the whole effect was brilliant in the extreme.

The assemblage having become composed, the candles were passed before the Pope, who placed his hand upon them, which was kissed by the attending priests. This ceremonial being completed, the candles were lighted, a procession formed, the Pope again mounted upon his big chair under a richly embroidered canopy commenced to move around the church to bless the people, returning to his seat in the tribune. Then commenced the ceremony of high mass, in which the Pope assisted, the services lasting upward of an hour. The music, by male voices, was also very fine; indeed, it forms one of the remarkable features of the services of St. Peter's. We have wandered through the Coliseum by moonlight, and have been hooted at by the owls that haunt its immense arches. We have visited the famous Vatican, and traversed the ruins of the Palace of the Cesars, famous baths, temples, churches, catacombs, and prisons, yet dull, dirty old Rome continues to grow in interest.

S. H. W.

Separating Coloring Matter from Madder and other Plants.

Alfred Paraf, of Boston, Mass., has lately received a patent for the above new and useful process of liberating the coloring matter of madder and similar vegetable substances from the ligneous matter or cellulose with which it is combined in the plant, and hereby declares that the following is a full, clear, and exact description of the said invention.

In the ordinary process of dyeing and printing madder colors, only about half the coloring matter is utilized; and this portion is obtained by tedious processes, requiring a large amount of manual labor. The object of this invention is to liberate the coloring matter of the madder root or similar plant from the ligneous matter, so that, practically, the whole amount of coloring matter of the root may be utilized. The invention is based upon the fact that cellulose becomes soluble when in the presence of cupric oxide with ammonia. The madder root, previously dried and reduced to powder by grinding or other means, is washed with water by several successive operations until the sugary matters are separated and removed, which may be ascertained by testing the wash water for sugar with Bareswell's liquor in the usual manner. The damp, washed madder root, drained from the water, is next subjected to the action of cupric oxide with ammonia by steeping, in an open vessel, in aqueous ammonia in which copper turnings have been placed. This operation may be conveniently performed in an earthenware vessel, fitted with a perforated cover, which permits the access of air. In performing the operation, it is expedient to use one pound of metallic copper and seven gallons of aqueous ammonia for each pound of ligneous matter to be removed. Thus, assuming that the madder root contains thirty-eight per cent of ligneous matter, thirty-eight pounds of copper turnings and about two hundred and sixty gallons of aqueous ammonia may be used for each one hundred pounds of dry ground madder root. In the presence of the copper, the aqueous ammonia, and the air, the ligneous matter of the plant is gradually dissolved, while the coloring matter and copper form insoluble compounds, which remain in the liquid in the form of a precipitate. The operation requires generally several days, during which the materials should be occasionally stirred. The ammonia in the liquid also must be renewed, which is conveniently effected by passing a current of gaseous ammonia into the liquid in the vessel. The coloring matter being thus set free from the ligneous matter or cellulose by the solution of the latter, the next operation is the separation of the coloring matter and copper. This may be performed in several ways, as follows:

1st. By filtration, and by washing the precipitate. Then the precipitate is mixed with alcohol, and a current of sulphuretted hydrogen (H. S.) is passed into the mixure. This substance decomposes the compounds of the coloring matter and copper, setting free the coloring matter, and transforming the copper into an insoluble cupric sulphide. The coloring matter dissolves in the alcohol as fast as it is set free, while the cupric sulphide remains in the liquid in the form of a black precipitate, which is readily separated by filtration. The filtered alcoholic solution of the coloring matter may be concentrated by boiling until the coloring matters will crystallize; or, the coloring matters may be precipitated by adding acetic acid to the alcoholic solution until precipitation ceases, after which they may be separated from the liquid by filtration.

2d. After the removal of the dissolved cellulose by filtration and washing, a current of sulphuretted hydrogen is passed through the mixture until precipitation ceases. The precipitate is separated by filtration, dried, after which the coloring matter is extracted by treating the precipitate successively with small quantities of boiling alcohol. The coloring matter may be obtained from the alcoholic solution as in the previous mode.

3d. The compounds of coloring matter and copper, separated from the dissolved cellulose by filtration, are mixed (without previous washing) with a dilute solution of hydrochloric acid (H. Cl.), sufficient to transform the copper into the protochloride of copper, and the excess of ammonia into chloride of ammonium. The liquid is boiled for about ten minutes, or until the copper is dissolved in the form of the chloride, while the coloring matter remains in the form of a reddish precipitate, which is separated by filtration and washing.

4th. If the coloring matter is to be used at once for dyeing, the dissolved cellulose need not be removed from the compounds of coloring matter and copper, but a sufficient amount of hydrochloric acid (H. Cl.) may be added to the liquid to combine with the excess of ammonia, to transform the copper into the soluble protochloride of copper, and to precipitate the cellulose. The coloring matter, being insoluble in water and acid, remains in the liquid in the form of a precipitate. The precipitated cellulose and coloring matter are then freed of the chlorides of copper and ammonium by filtration and washing, and the product remaining in the filter may be used in the same manner as practised in dyeing with madder root; but, as the coloring matter in this product is liberated from the cellulose, and is only mechanically mixed with it in the same manner as it might be with any inactive, adulterating material, the dyer is able to utilize, practically, the whole of the coloring matter of the plant, instead of only about half of it, as in the ordinary method of using madder.

The filtered solution of cellulose obtained in any of the preceding modes may have hydrochloric acid added to it until the excess of ammonia is neutralized, the copper remaining in the liquid is dissolved in the condition of a chloride, and the cellulose is precipitated. The liquid may then be removed by filtration and washing, and the product utilized for any purpose that is expedient, one of such purposes being the manufacture of paper. When using the product for this purpose, I treat it with sulphuric acid, in the manner practised for transforming paper pulp into artificial parchment.

The material obtained by the above-described operations, designated, respectively, first, second, and third, may be used advantageously for either dyeing or printing, the material, when used for printing, being previously mixed with the acetate of alumina, or of iron, or a mixture of the two, to produce red, purple, or chocolate colors, and being also mixed with gum or starch in the usual mode of thickening. After printing, the cloths should be steamed in the usual mode, and washed with water, with or without soap. The material obtained by the operation designated fourth is useful specially for dyeing.

Composition for Cleaning Millstones.

Daniel Kindig, of Newville, Cumberland county, Pa., has patented a new solution, which, he says, if applied to the burr stone, keeps the same perfectly clean, and makes a more perfect and much finer article of flour, and a better yield; also enabling the miller, during all seasons, to use the No. 13 bolt, producing thereby a greater quantity of flour. While grinding garlic wheat, it does not become necessary to take up the burrs oftener than once in a fortnight. The solution is to be rubbed on the burrs with a scrubbing brush.

The solution is composed as follows: 1 gallon hot water; 2 oz. of borax; three balls, of the size of a hazel nut each, of sal-prunel; and ¼ pound of washing soda. Mix, and apply it to the burr. When grinding garlic wheat, it is not necessary to take up the burrs at all. It is sufficient to drop through the eye of the burr twice a day one of the above-described balls of sal-prunel, and that, he says, will keep the burrs sharp and clean.

Gold Mining in California.

Though the whole of the gold bearing region of California has been prospected, yet new discoveries of gold fields are continually being made. Many of these, however, are not workable on account of the scarcity of water, although some of them are very rich. Near the San Joaquin valley is a tract of mining region, fifteen by eight miles, rich in ores but entirely destitute of water. A canal has been dug to supply this section, and the result has been to make it one of the liveliest mining localities in the State. The stories of "big strikes, or the discovery of nuggets, which so excited the imagination of early adventurers are now seldom heard, either because it is found expedient to keep such things quiet, or because they are found less frequently. Nuggets, or "*chispas*," have been found weighing 45 pounds, and worth $15,000. But the most interesting, and it is supposed most profitable, mining is that known as the "deep placer mining." Certain sections of the state are traversed by troughs or beds, supposed to be the course of ancient rivers, which for ages have received the washings from the mountains. These beds are rich in auriferous metal. But the deposits are so deep, and the surface has become so hardened, like cement, that the ores are reached with difficulty by shafts, open cuts, or tunnels. The sinking of these often prove very expensive, sometimes involving a cost of $200,000, and several years' labor. The gold from these shafts and tunnels is separated from the earth and sand by sluice-washing. If, however, the material is hard and cemented, it is crushed as the vein or quartz ores are. This sand and gravel is sometimes found to be marvelously rich, not unfrequently yielding thousands of dollars to the cubic yard. On this account the mining laws have restricted the ownership of such sections to fourteen square feet for each individual, from which space handsome fortunes have been made. Hydraulic mining has been in use for fourteen years, and is at once a successful and ingenious plan. The material chiefly operated upon by this plan consists of immense masses of alluvial deposits, drift, and gravel, forming mounds and sometimes high hills. These rest on a base of rock. The whole mass of deposit contains gold grains, which grow more plenty and richer as the rock is approached. To remove these superincumbent masses water alone is employed, and the whole may be said to be literally washed away.

Such is the completeness of the adaptation, however, that the same process by which the earth is removed is made to separate the gold from it. The digging and washing are both effected by the same power—water. In many instances, where the material of these deposits is so compact as to resist the action of the water, a tunnel or drift is run in at the base of the mound, which is filled with powder—sometimes two or three hundred kegs are required for the purpose—and by means of a fuse exploded. Many hundred tuns of earth are thus crumbled and shattered, and so easily carried away by the hydraulic process. It is estimated that one fifth of all the gold of California is taken out by this process. The average price paid to miners in the hydraulic mines is $3 per diem, and the yield per hand varies from $15 to $30 per day.

BEACH MINES.

This class of mines is confined to the northwestern portion of the state, extending into Southwestern Oregon. They are located, as their name implies, directly on the coast. Geologists account for their origin on the hypothesis that ancient rivers carried down these auriferous sands, and deposited them in the ocean. Afterward, by some unheaval of nature, they were thrown up into elevated shores, or sometimes bold bluffs or promontories. These banks are now being reduced by the action of the waves, and the sand containing the gold particles is left on the beach by the receding tides. The prospecting is done after the ebb of the tide, and when a deposit is discovered the sand is gathered quickly by the ever-vigilant miners, and carried to high ground before the tide flows again. As a consequence, these mines are ever shifting, and where a rich haul has been made at one time, in twelve hours there may be no appearance of gold. After the gold bearing sands have been gathered in this way, they are usually packed on mules and carried to sluices, where they undergo the usual washings for purposes of separation. This style of mining is profitable, but the misfortune has thus far been that these gold-bearing beaches have fallen into the hands of a few owners, usually companies, who own stretches of miles together, and thus prevent that individual enterprise so essential to mining success. The daily yield of some of these beach washings runs from $5 to $15 per hand. The wages paid is about $70 per month. Owing to the continual wearing of these gold ridges, and the never-ceasing deposits by the tidal waves, the supply of gold from beach mining may be set down as unceasing.

TAIL WASHING.

This is simply rewashing the refuse matter of the sluices. The earth, sand, and gravel from the washing machines collect in great quantities, and frequently interfere with mining operations. Their removal is then made a matter of convenience, as well as wealth, for gold-bearing earth will frequently

pay after two or three washings. This branch of operations has been resigned principally to the Chinese.

GROUND SLUICING

is a process by which the superincumbent masses of poor gold-producing earth is removed from the richer substrata, by means of water. This process is almost identical with the hydraulic plan—the same agent being employed and the same result accomplished. The only difference is, the latter is confined mainly to the river bed and valley deposits, while the former is made use of only in favorable localities. Some of the claims worked upon this plan pay well, averaging from $10 to $20 per hand.

QUARTZ MINING.

The only other kind of mining operation carried on in California is that known as quartz mining. The mines of this description pierce the mountains and run far below the surface of the earth, following wherever the quartz veins or lodes may chance to lead. The ores of gold are imbedded in the rock, and, in order to extract them, the first operation after they are brought to the surface is that of crushing. This is done with the stamp mill. The ores are then roasted, and the pure gold obtained by chemical processes. The whole number of quartz mills now in operation in the state is not far from 500, running 5,000 stamps, and erected at a cost of $4,000,000. Great improvement has been made in the machinery of these mills during the last few years, and many of them have proved good paying investments. The majority of them are run by steam. Quarts ores yield from $15 to $40 per tun; the latter figure, however, is only reached by a few of the very first quality mines. The veins of ore are often pursued to a great depth. A lode in the celebrated Hayward mine has reached a vertical depth of 1,900 feet beneath the surface.—*Philadelphia Press.*

Sketches from the Late Paris Exposition.

Among the innumerable variety of chemical products and minerals at the late Exposition, it was gratifying to note so many substances which but a few years since, from their rarity, possessed merely a scientific interest, that are now manufactured at will and in large quantities. Wöhler discovered, in the silicate of alumina—pure kaolin—the metal aluminum, and St. Clair Deville, in 1854, first produced it on a large scale, and since then it is used for technical purposes. Although aluminum has not gained the importance which had been predicted for it from its great lightness, it is, notwithstanding, destined to play a conspicuous role in the arts. Cryolite, again, is a mineral which, for a long time known only to the mineralogists as a rarity, was first turned to practical account by Henry Rose. Since the discovery of heavy beds of the "ice-stone," an industry has been established in the extraction of soda and production of fluosilicic acid, a valuable substance, not to be disregarded in the refining of the crude beet molasses. The beautiful iron—free sulphate of alumina, manufactured in large quantities in Natrona, Pa., is being substituted generally for alum, which because of its property of holding a large amount of water of crystallization, increases the expenses of its transportation. The chloride of chromium, a magnificent violet substance, has been applied to the printing of wall paper, imparting a peculiar, beautiful aspect, hitherto unknown. The metal thallium, which was discovered by spectral analysis and exhibited in all its important combinations by Hopkins and Prof. Laury, is already employed by the latter as a substitute for lead, in the manufacture of glass, thus forming a new crude material in the preparation of highly refractory optical lenses, and of brilliant imitations of gems. The indium, exhibited for the first time in bars of several pounds' weight, will find use in pyrotechnics, and, perhaps, also in photography, more so than magnesium, on account of its emitting a chemically, very active light. The naphtaline of the gas works forms the starting point for the preparation of a new coloring principle, which, on account of its relation to the alizarin of the madder, has, with its compounds, found use in dying and printing. The camphor-like smelling sesquichloride of carbon, a substance theoretically important as forming a link between organic and inorganic chemistry, serves at present for the production of the beautiful aniline dyes, not to refer to its value as an antidote to cholera.

Vegetable bases, formerly to be found but in minute doses, were exhibited at the Exposition in enormous quantities. We found among them the rarest opium alkaloids and their derivaties, for the extraction of which at least three hundred pounds of veritable thebaic opium was requisite. The exhibited samples of brilliant crystallized strychnine would have been enough to poison a thousand persons, a single grain being sufficient to destroy life. Four thousand pounds of coffee beans, at least, must have been requisite for the extraction of the amount of caffein we met with. If many of the last mentioned chemicals have not yet gained any technical value, if many are only of pharmacutical interest, they are nevertheless capable of giving an idea of the extent of technical chemistry and the state of an industry of a country, as their presence proves sufficiently what materials, apparatus, and knowledge must have been at the disposition of the respective establishments. Until a substance has left the laboratory of the investigator, it has no industrial importance; as soon, however, as it comes from the hands of the manufacturer, it is a representative of industy. Hence an enumeration of these preparations would give us an insight into the resources of a country, were the number not too great, nor too tiresome to be calculated. Also those bodies, the discovery of which belonged to a former century, regarded long enough as useless, will give a most brilliant testimonial as to the persistence of progressing science.

MESSRS. JACOBS BROTHERS of Columbus, Ohio, have sent us a specimen of large crystallized sugar, made from sorghum, without chemicals or bone filtration.

Correspondence.

The Editors are not responsible for the opinions expressed by their correspondents.

Efficiency of Small Fire Engines.

MESSRS. EDITORS:—In your paper of January 11, 1868, page 21, is an account of experiments made in Germany, to prove that small quantities of water thrown from little engines are very efficient for putting out fires. This subject has been understood and acted upon by a few persons in this neighborhood for years, and I now propose to do what I can to bring it into general use by comparing it with the workings of the "Extinguisher," as it is called, which has the past year been exhibited nearly all over the country.

I have no engines now which I care to sell and my motive is the same which prompts me to take my engine to a fire, to save property and prevent distress. I have no doubt whatever that the general introduction of small engines into fire departments, with steam fire engines, will result in preventing at least three fourths of our fires, and of lessening the rate of insurance an equal amount, that is, three fourths. I am sure this will be so when a new kind of engine, of which I intend to write to you soon, is brought into use with the small and the steam fire engines. At present, however, I wish to write only of small engines, and to address myself to the pump makers of the United States. A cast-iron pump can be made by any one, weighing no more than forty pounds, which will stand up when left alone, which can be put at first in a water pail and yet there can be fired from it by one man a perfectly steady stream of water three eighths of an inch in diameter that can be raised to a hight of more than thirty feet, and that water will put out more fire of any kind of wood, tar, kerosene, resin, or, in short, that of any fire, however made or composed, than any "Extinguisher" which has ever been exhibited.

I do not make this assertion without knowledge, but I have such an engine which has done this work, which has been to and extinguished fires quite equal to those described in your article of the German exhibitions, and from fifteen and more years of experience I tell you that the time has come when the people of this country should understand and act upon the knowledge that fires to be combatted successfully must be reached and fought sooner than they are now or will be by the steam fire engines, or by large man engines. Every person has had an opportunity of seeing the apparently wonderful power the "Extinguisher" has over fire. Your article of the German experiments proves that little engines throwing only cold water will, can, and did extinguish more fire than the "Extinguisher" has done. The building experimented upon in Germany was twice as large as those used here for the "Extinguisher" experiments, and only one engine was used for throwing water, while at the trials here half a dozen were always ready and from three to five used. And now will every maker of pumps engage in the effort to prove their great utility and efficiency for checking two of the great evils of our country, fires and insurance; fires first from their disastrous effects, and insurance from the everlasting strain upon the business portion of the people which it involves. A pump, such as I have described, with six feet of hose and ¾-inch pipe should cost at retail no more than twelve dollars, or to towns and cities in large numbers from eight to ten dollars. Will every pump maker make experiments like those in your number of Jan. 11th. They will be astonished, for the idea in this country has been that a stream less than an inch in diameter and a power of fifty men or steam were of no use to quell a fire with. And this is true. There are so few of them and it takes so long to put them at work, that the fire, increasing by geometrical progression, doubling its proportion and power every three minutes, has become uncontrollable before they have got well at work. Take the fire which destroyed the city of Portland, for example. People supposed it was one fire. At first there was one fire, and the great engines from every part of the city rushed to it. Before a stream of water had been thrown upon it from one of them, the burning shingles and sparks of the fire had been taken by the high wind which was blowing to other places and set six other fires, so that by the time that the first engine got water upon the first fire there were seven fires in the city in a gale of wind, and before the engines could be put at work upon them, they had in their time made more fires than there were engines in the city. The result we all know. Now let us suppose that there had been, beside the large engines, five hundred such as are described in your paper of the 11th of January, or as much better as a Yankee can make, and that they were equally distributed about the city, in the houses of careful and judicious working men, and that each one who could extinguish a fire before a large engine could be put to work should have five dollars. The six fires before spoken of when they were seen were no larger than a man's hat, and one of them could have been extinguished in half a minute. So of all the others. There would never again be a great fire like that at Portland after a common sense fire preventive system were adopted like that of our people who, when at war, used every means large and small, but vastly more of the last than the first, to destroy an enemy.

JOSEPH BIRD.

Mt. Auburn, Mass.

Things to be Remembered by Machinists.

MESSRS. EDITORS:—Believing the observance of the following points to be indispensable to good workmanship, I make no apology for submitting them to you. If they were carried out in every shop in the land we should have fewer complaints of slovenly workmanship:

Never turn a shaft without drilled centers. Never turn the body until the ends are squared to the center and to the length. Never allow a nut and bolt to pass that will not run down properly on each other. Never pass a nut that does not screw down fair on its seat. Never take the last cut on a thin casting, whether in the lathe or planer, without easing off the chuck or clamp that confines it. Never use a tool square across the face to rough-off with. Never attempt to work steel that is harsh from want of proper annealing; better carry it back to the smith and have it annealed properly than waste time and tools in doing what will be only a poor job. If you can buy good tools cheaper than you can make them, buy them.

E. P. W.

New York city.

The So-called Heat Shadows.

MESSRS. EDITORS:—Your correspondents, in attempting to explain the above-mentioned phenomenon in your number of Feb. 15, p. 101, overlook the true cause of the details they so minutely and correctly describe; it is not that heated and rarefied air transmits the light more perfectly, but simply that the deviation of the light from its naturally straight course, called refraction, caused by those surfaces of the heated and rarefied air when they are in contact with the colder and denser air. Descartes discovered, two hundred years ago, the law of refraction which governs the changes in the direction of light when passing from a rarer into a denser medium, or *vice versa;* the phenomenon in question is simply one of the consequences of this law of refraction of Descartes. Complete explanations of this law are found in all good text books on Natural Philosophy, to which I refer for further details. I will here only speak of it in so far as regards the case in question.

When light falls from one transparent medium perpendicularly on the surface of another, its direction undergoes no change; when it falls obliquely its direction does change, and this change in direction, or this refraction, is greater in proportion to the obliquity and the difference in the density of the two media. When now, heated air is in contact with cold air, and a ray of light passes from one to the other, and in falling on such a part where both the media are in contact, passes obliquely through the surface of contact, its direction must necessarily change. When a stove is surrounded by a layer of a transparent medium denser than the air, it would act similarly to a glass lens, and converge the rays; but the air around a hot stove being, on the contrary, expanded, rarer than the surrounding air, it will do the contrary thing, and diverge the rays; that means the light will be refracted outward from the stove, making the shadow of a hot stove larger than of a cold one. The light passing close along the stove will consequently be refracted in such a way that it will fall where other unrefracted light is falling, will reinforce it, and this is the cause of the lighter band, very correctly represented in the figure on page 101. The tremulous motions are simply caused by the continually changing position of the surfaces between the hot and cold air, consequent on the continuous upward motion of the hot rarefied and lighter air; the direction of the rays of light, when passing through such air, is therefore necessarily also continually changing—here increasing the light in one spot, there obstructing it from another; therefore these so called shadows are simply results of continually changing refractions, and are no more shadows than the image in the camera obscura, which also is a result of refraction by means of a properly adjusted glass lens.

By the same cause (refraction), the sun and moon appear, when rising or setting, one half degree higher than they really are, and may be seen in slowly changing forms, and even sometimes in vibration by a similar cause.

P. H. VANDER WEYDE.

Calculating Nominal Horse Power of Engines.

MESSRS. EDITORS:—I have seen the following rule for nominal horse power of the steam engine: Multiply the square of the diameter of the cylinder in inches by the cube root of the length of stroke in feet, and divide by 47, the quotient is the horse power.

Now, suppose we take two engines, each having 70 inches diameter of cylinder, one having 10 feet stroke, the other 5 feet stroke, and ascertain the nominal horse power of each:

$70^2 \times \sqrt[3]{10} \div 47 = 224{\cdot}6$ horses.

$70^2 \times \sqrt[3]{5} \div 47 = 178{\cdot}2$ horses.

Now, if the pressure of steam had been the same in these two cylinders, and both pistons moved with the same velocity, it is manifest that the powers will be the same, or nearly so. Yet, by this rule, they are made widely different; and if they are made so widely different, when the pressure of steam is supposed to remain constant, how would it be to use 40 pounds in one and 80 pounds in the other?

New Britain, Conn. W. E. CRANE.

[It appears to us that two very important elements are left out of the above proposition—the pressure of steam and the velocity of piston.—EDS.

NEW ELECTRICAL BATTERIES.—M. Balsamo has presented to the French Academy a battery, both elements of which consist of iron, the one being immersed in a solution of chloride of calcium, the other in diluted sulphuric acid, the two solutions being separated by a porous cell. The iron in the sulphuric acid acted as the positive element, and the other as negative. A constant and quite an intense current is obtained by this arrangement. Another novel battery, termed an "electric buoy," is now being experimented upon at Cherbourg. It consists of a zinc plate and a cylinder of carbon, attached to a cross piece of wood, having sea water as an exciting liquid. Still another variety is that of M. Miergue, of Bonfarik, consisting of a cylindrical cell of porous carbon, containing nitric acid, and an exterior cylinder of amalgamated zinc in a cell full of water.

ROHRER'S IMPROVED GUTTER BRACKET AND SUPPORT.

The engraving represents a method of securing eaves gutters to buildings whereby beauty and usefulness are both secured. The brackets, now usually merely ornamental appendages, are, in this device, made of use in supporting the gutter, while that service does not detract from their office as ornaments. The tops of the brackets—which may be made of any form desired—are hollowed to receive the gutter, the back edge of which is held in place by the projection of the

eaves, and the front by strips of metal secured to the front edges of the brackets, and provided with a hooked end to embrace the edge of the gutter. The result is a neat and secure device for supporting eaves gutters. The attention of builders and others is directed to this economical and efficient device. Territorial and manufacturing rights are for sale by the patentee.

Patented through the Scientific American Patent Agency, Feb. 4, 1868, by Jeremiah E. Rohrer, Rohrersville, Md.

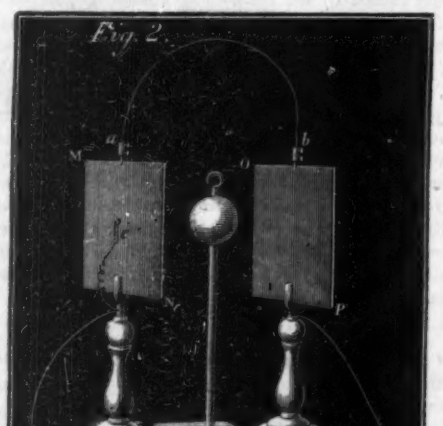
Science Familiarly Illustrated.

HEAT AND COLD.

BY JOHN TYNDALL, ESQ., LL. D., F.R.S.

Lecture V.—Continued.

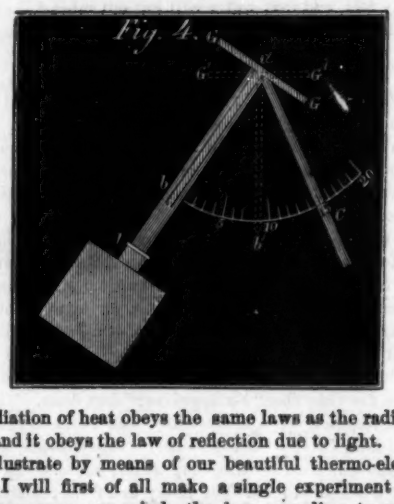
You see I have here two sheets of tin, M N and O P, one covered with lampblack, and the other uncovered. I place them facing each other, and I put this stand exactly midway between them. Now, I have a little device here—a telltale—



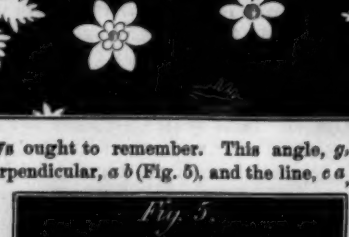
which will inform me which of these plates is heated. Suppose I heat this plate. Observe what occurs at the magnetic needle. I simply warm that plate by putting my finger upon it. The red end of the needle moves towards me. I cannot explain the wonderful power which moves the needle. It is what we call an electric current, and is produced by the union of the two metals of the thermo-electric pile. When the plate is heated you see that a deflection of the needle is produced. The needle will return to zero when I withdraw my hand. I want you now to judge which of these two surfaces absorbs radiant heat most freely. The needle will not rest at zero unless these two plates are exactly at the same temperature. If one becomes warmer than the other the needle will deviate from zero. Thus we have it in our power to determine which plate absorbs heat most greedily. Now Mr. Cottrell will give me a ball of copper which is heated to redness. You observe it is radiating its heat as a luminous body radiates light [The red hot copper ball was placed equidistant between the two plates of tin, one of which was coated with lampblack. In a few seconds the needle of the pole began to travel from the zero.] Thus we prove that this surface coated with lampblack, which is the best radiator, is also the best absorber We might experiment with a variety of substances in this way, and prove that great differences exist as regards their absorptive powers.

It is very wonderful what a slight and trivial thing will be sufficient to prevent the absorption of radiant heat. I have here an exceedingly instructive substance. It is a piece of paint given me by Mr. Hills, of the firm of Bell and Co. A portion of this paint is coated with gold leaf, and though the gold leaf is infinitesimally thin, it has been competent to protect the surface of the paint from the action of radient heat to which the whole thing was exposed, while the other part of the surface, which was not covered with gold leaf, has become blistered. Where the gold leaf was present it prevented the rapid absorption of the heat.

I have here a sheet of paper covered on one side with iodide of mercury, a substance which has its color discharged by heat. On the other side of the paper there are certain figures represented by a thin coating of metal. I place the paper with the iodide of mercury side downwards; and over the other side I will hold a hot spatula which will radiate heat to the surface of the paper. Where the thin coating of metal is, the heat will be rejected, but where the paper is not coated the heat will be absorbed, and then it will reach the iodide of mercury on the other side and destroy its color. You will find that in this way we shall produce on the underside of the paper a perfect picture of the figures on the upper side, for you will find that the red color of the iodide of mercury will remain underneath the metal coating, for that coating has the power of rejecting the heat as the gold leaf rejected the heat in the other case, and so protected the paint and prevented its blistering. [The experiment was performed with a successful result.]

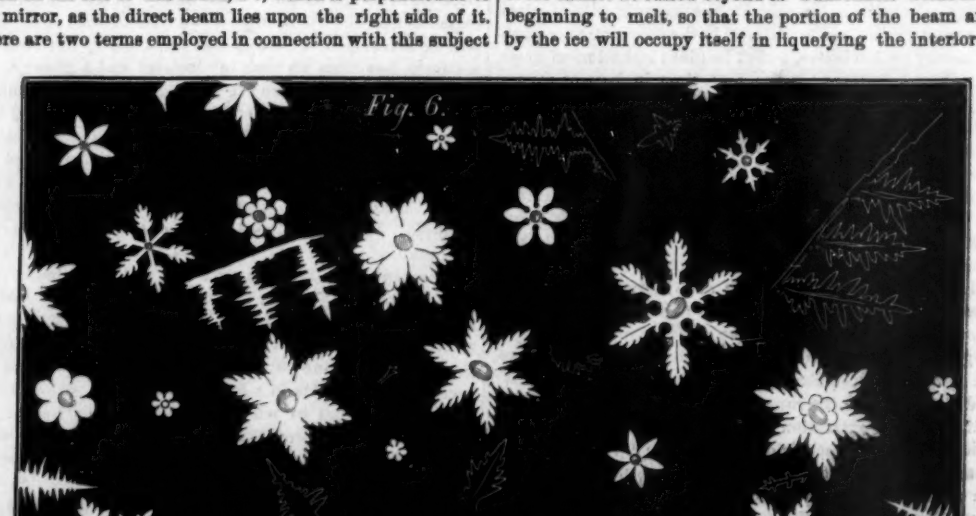


The radiation of heat obeys the same laws as the radiation of light, and it obeys the law of reflection due to light. This we can illustrate by means of our beautiful thermo-electric pile; but I will first of all make a single experiment that shall impress upon our minds the law according to which light is reflected. It is a very simple experiment, but I trust it will be very effective as far as regards the proof of the law. Mr. Cottrell, who knows my requirements very well, is now placing there in front a little looking-glass, G G. I intend to send a beam of light, *a b*, from the electric lamp, *l*, towards the mirror G G. The beam will strike upon the mirror, and be reflected. How? So that the reflected beam will lie as much on the left of this index, *a b*, which is perpendicular to the mirror, as the direct beam lies upon the right side of it. There are two terms employed in connection with this subject which the elder boys ought to remember. This angle, *g*, made between the perpendicular, *a b* (Fig. 5), and the line, *c a*, along which the direct ray goes to the mirror, is called the *angle of incidence*.—The angle, *h*, between the perpendicular *a b*, and the reflected ray, *a f*, is called the *angle of reflection*; and the law as regards both light and heat is this—that "the angle of incidence is equal to the angle of reflection." If I am right in what I have stated you will find the reflected beam as far from the perpendicular on one side as the direct beam is from the perpendicular on the other side. I want now to prove the same with regard to radiant heat by a very rough experiment, and show you that it obeys the same law as light. I take this piece of tin, which will reflect heat, and hold it so that the radiant heat from this fire will fall upon it, and then be reflected, according to the law I have just mentioned, on to the face of the pile. I have no doubt that reflected heat will warm the face of the pile, and cause the needle to move towards me. We thus see that heat exhibits the same law in this respect as light.



I wanted to make one or two experiments more, and I wished to do so, as before, by means of our thermo-electric pile; but I find that the needle does not act freely although the pile does its duty. Hence I think I must tell you by my tongue what that needle, if it were in a proper condition, would have told you by its motion. I intended to make the needle my voice but it has become dumb. I wanted to show you that this thing we call radiant heat passes in very different degrees through different bodies. I wanted first to compare the passage of heat through glass with its passage through other bodies. I have here a piece of rough glass, and I have also a beautiful substance—a very common one, but to me more precious than the diamond, though the diamond is a beautiful thing. This substance is rock salt. This would allow heat to pass through it with perfect freedom, while the glass would cut it off. So with different liquids. I have here a liquid called bisulphide of carbon, and here I have some of the well known liquid called water. If I filled one cell with water and another with bisulphide of carbon, I should find that the bisulphide of carbon would transmit heat with great freedom, while the water would not transmit it at all. Water is, indeed, as regards heat, one of the most opaque bodies in nature to all but incandescent or luminous heat. It is a perfectly opaque body to all rays emitted, say from the surface of a boiling kettle, or from the heated cube, or from the cheek of the young philosopher who helped me in an experiment in the early part of this lecture. During the burning of Her Majesty's Theater the heat struck upon the windows of a club house opposite, and as the glass would not allow the heat to pass through, the windows became hot, and thus the glass was broken. Had those windows been composed of rock salt the heat would have passed through them, and they would have remained perfectly cool, although there might have been an efflux of the most powerful radiant heat. If time allows, I will show you in the next lecture that we can boil water by radiant heat passing through bisulphide of carbon, though the same heat does not boil the bisulphide of carbon through which it is transmitted, notwithstanding that bisulphide of carbon boils at a lower temperature than water.

I have told you that different bodies, both solid and liquid, possess the power of transmitting heat in different degrees. Now, the body which absorbs the radiant heat, instead of transmitting it, becomes warm by the absorption. Ice is a body which is exceedingly opaque to the rays of heat, but allows light to pass through with freedom. I intend to place a piece of ice in the path of a beam from the electric lamp, and which will be a mixed ray of heat and light. The ice will stop by far the greater portion of the radiant heat, and the heat will be lodged within the ice. But the temperature of ice cannot be raised beyond 32° Fahrenheit without the ice beginning to melt, so that the portion of the beam arrested by the ice will occupy itself in liquefying the interior of the



ice. It will liquefy the ice internally, and I want you to see the wonder and the beauty involved in this beautiful substance which you skate over every winter, but, perhaps, never think of. This beam of light and heat passing into the ice will dissect the ice and separate the crystals, and you will see the beautiful figures into which the ice resolves itself. The ice will break up internally into most beautiful flowers consisting of six petals. In order to enable you to see these figures I must magnify them very much, and for that purpose I shall cause an image of them to be thrown on this large white screen. The lamp is placed in the gallery to increase the distance from the screen, and so make the figures appear larger. Mr. Cottrell has a lens there, and he will now take a piece of ice, and make the surface smooth by putting it on a warm body, and then place it in the path of the

beam. The ice has been cut parallel to the plane of freezing from a block of the so-called Wenham Lake ice. It has been cut, I say, parallel to the surface along which the ice grows. [After a short time the image of the ice-flowers began to appear on the screen.] I do not know any experiment that I have ever made which is more delicate and beautiful than this. The flowers are growing larger and larger. First of all you see these leaves, and within you see a crimping. Those spaces which you see are spaces entirely devoid of air, for you know that the water occupies less space than the ice. The ice is larger than the water which formed it, and as the inner portions of this piece of ice melt, the water occupies less space than the ice, and a small vacuum is produced at that spot. This screen presents a glorious surface of ice-flowers. Every particle of ice is built up in this beautiful way. The ice has now become disintegrated, but I do not think your patience has been ill rewarded.

TURNING A MOVABLE WHEEL AROUND A FIXED WHEEL.

"How many revolutions on its own axis will a movable wheel make in rolling once around a fixed wheel of the same diameter?"

In the earlier stage of this discussion, the two-revolution philosophers found no fault with the terms of the original question, as above presented, but without any qualification took the position that our answer, "one," was an error, and theirs, "two," the only true and correct reply. One of these champions, referring to the terms of the question, says, "It seems impossible to conceive how it could have been more clearly put, and we think its propounder deserves great credit for its extremely direct and explicit language."

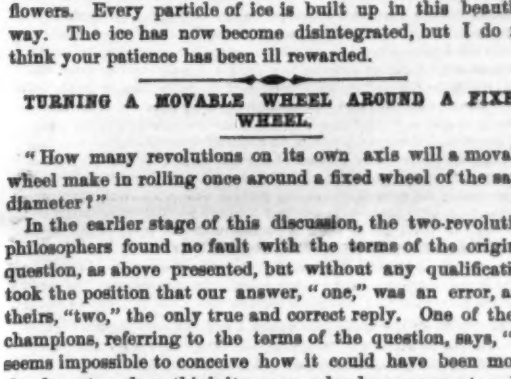
But as the discussion proceeds, the two-revolution philosophers appear to have become sensible of the necessity of attaching new conditions or explanations to the original question, in order to render their several positions tenable. One portion of them think that it ought to be expressly stated as part of the question, whether the axis is to be stationary, or is to revolve with the wheel; for if it revolves, the wheel will turn only once on its axis, but if stationary the wheel will turn twice on its axis.

To these we have replied that they might make the axis fixed or stationary, just as best suited them. In our view, the number of revolutions made by the wheel upon its own axis, will be precisely the same in either case, namely, one. Others of the dual philosophers deem it important that the word axis should be more explicitly defined. Some want the axle-tree, or journal on which a wheel ordinarily turns, to be defined as the axis. Others want the axis to be settled as being an imaginary point or line, drawn through the center of the moving wheel. To these we have answered that they might take their choice, as it did not affect the practical result, for the wheel will make the same turns on its own axis, whether the latter is defined as a point or a bearing.

With another portion of the two-revolution philosophers the daylight is beginning to dawn. They begin to see that unless the axial plane of both wheels is the same, all their mathematical calculations, postulates, theorems, astronomical references, and other supports, together with the dual conclusion based thereon, are likely to fall. They have been invited to answer explicitly whether the movable wheel in figure 11, made *one* or *two* revolutions upon its own axis; but have not yet responded. We also learn that our city two-revolution friends have been too modest to appear at the Printing Wheel Manufactory to claim their prizes, worth $10 each, deliverable on showing that the printing wheel turned twice on its own axis in rolling once around a fixed wheel of the same diameter. Perhaps they did not wish to bankrupt the correspondent who made the offer, by carrying off his entire stock in trade.

Here is a diagram of a little contrivance on the same principle as the printing wheel which any two-revolution philosopher, residing at a distance may readily construct. B is a

Fig. 18.



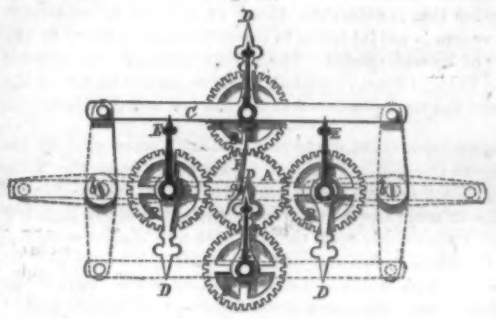
wheel set in a forked handle, C. Now roll B once around a fixed wheel, A, of same diameter, such as a table leg or a bottle and if you succeed in making B turn more than once upon its axis, then come to town with confidence and take home one of the $10 prizes offered last week.

We have lately made count of the wheel letters, and find we have some five hundred on hand; and still they come. We beg to remind correspondents that there are many other interesting topics that should engage their attention; and for fear that all their ideas will turn into wheels if the discussion is prolonged, we feel under the necessity of now moving the previous question. Those of our way of thinking will say "one." Contrary minds "one and a quarter," "two," "three," or "four," according to their several positions. Except for some novel or interesting comment we propose with the present number to dismiss the subject.

To the many esteemed correspondents who have taken part in the discussion we return our thanks for the candid and courteous manner in which they have presented their views.

MESSRS. EDITORS:—I think in counting the revolutions of a wheel on its axis from a pointer indicating its axial line, said pointer should not be allowed to revolve (as in W. E. H.'s model) but should always point in the same direction, say to one of the points of the compass. The mere changing of its position is no reason why it should change its direction. On referring to the accompanying diagram, it will be readily seen that the movable wheel, B, makes two revolutions on its axis while passing around the fixed wheel, A, once, its pointer, D, having been in conjunction with the pointer, E, indicating the axial line twice during its circuit.

Fig. 19.



I would add that the fact of the movable wheel winding the end of a string around itself only once while performing its circuit, the other end being held across the center of the fixed wheel, is not a proof of one revolution, as some of my "one revolution" friends will have it, but a distinct proof of two revolutions, which I think I can make clear by the following illustration.

It being conceded that the moon makes a revolution on its axis while passing around the earth, we will suppose one end of a line fastened to the moon and the other end held on the earth. How many times would the moon wind the line around itself while passing once around the earth? We must answer, *no times*. Now suppose that by some cause it made two revolutions instead of one on its axis, how many times would the line be wound around on completing a circuit. We now answer once, of course, consequently proving "two revolutions" instead of "one."

Two miter wheels, one fixed and the other held in position by means of an axle fastened at right angles to the axle of the fixed wheel and made to revolve around it in gear with the fixed wheel, seems to be regarded as an illustration of the "one revolution" theory. I think it should not be noticed in connection with this question, it being in fact but a wheel rolling on a plane, describing a circle of its own diameter, the plane of the wheel being at right angles (or nearly so) to the plane on which it rolls. A. W. BROWNE.

Brooklyn, N. Y.

A. W. B.'s letter was accompanied by a very neat model, of which the diagram, Fig. 19, is a view. A fixed wheel, B, movable wheel, and C, a bar-carrier, which conveys the wheel, B, around A. The ends of bar, C, are pivoted upon wrists, *b*; the dotted lines indicate different positions of C. D, index attached to B; E, index attached to bar, C; the center pin of E forms the journal or axle on which B turns.

This device differs not essentially from those presented by W. E. H., pages 150 and 166. In all of them that portion of the carrier which supports the movable wheel has the axis of motion at the center of the fixed wheel. In Fig. 19, the movable wheel makes one revolution on its own axis in rolling once around the fixed wheel, as may be readily proved by extending the cord, F, from *g*, to the movable wheel on which the cord will wind once. But A. W. B. appeals to the moon and earth to prove that, because a cord from a fixed wheel to a moving wheel winds once, therefore the latter turns twice on its axis. As neither of the bodies on which he depends are fixed, we submit that his appeal cannot rest.

Having called A. W. B.'s attention last week to Fig. 11, in which the one revolution of the moving wheel upon its own axis is isolated, and made distinctive, our correspondent, it will be observed, declines to attempt to apply his two-revolution doctrines thereto.

MESSRS. EDITORS:—While the learned are demonstrating that a wheel revolving around another of the same size, the latter being fixed, will turn on its own axis twice, will you permit an unlettered farmer to have his say? I have carefully studied the diagrams on page 106, present volume, and, notwithstanding the apparent clearness of the demonstrations, I can demonstrate their fallacy thus: Postulate, attach one end of a cord to the rim of a wheel, and the other end to a fixed axle projecting from the center of the wheel, and the cord will be wound once around the projection at each revolution of the wheel, on its own axis. Now, any one can see, by experiments, or by a careful study of the diagram of Mr. Hepburn, that such a cord would be wound but once around the supposed projection, while the wheel was passing once around its fellow. *Ergo*, the wheel made but one revolution on its own axis. WM. BASSETT.

Birmingham, Mich.

P. S.—Of course these gentlemen will find out, in due time, that one of the revolutions of the wheel is not on its own axis, but on the axis of the fixed wheel. N. B.

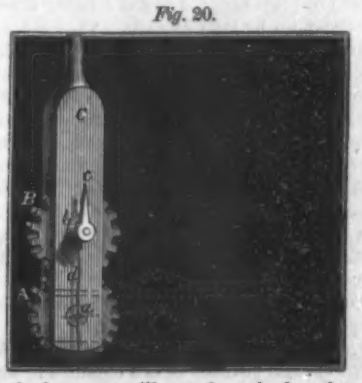
MESSRS. EDITORS:—The "wheel problem" has probably excited more thought and investigation, and will end in more benefit to a large class of your readers than any similar question started in your paper for years. With a simple model it is not difficult to convince nine out of ten that the wheel revolves twice on its axis in rolling once around the fixed wheel, and very difficult to convince them that the axis being carried around the circle with the revolving wheel neutralizes one half the apparent result, showing the revolution on its axis to be "once." The writer is not, therefore, "astonished at your patience" in keeping the question *open*, the result of which will be to *open* the eyes of many o your readers, and also to increase your subscription list.

INVESTIGATOR.

West Pittsfield, Mass.

MESSRS. EDITORS:—I am searching for new and important principles in scientific knowledge, and at first I did not see the benefit that could possibly be derived from the discussion of the wheel question. But, now, I really think I see the point; and I conceive it to be in the center of the fixed wheel in the form of a pivot, *a*, upon which we will place a lever,

Fig. 20.



C, fixed to the lever we will put the axle, *b*, and a pointer, *c*. Now we will place upon the axle the movable wheel, B, and we are ready for the original question, to which we shall pay special attention.

How many revolutions will a movable wheel make rolling *around* a fixed wheel? Around is the word that governs the answer, and signifies moving in a circle. Every circle has a center—no matter if it is only imaginary—and for the benefit of my many friends, I have provided the lever with a convenient handle to the center of the fixed wheel, so they can all take hold and roll the movable wheel once around the fixed wheel, and then they will be able to decide by carefully watching the change of position of the pointer, how many times the movable wheel turns on its own axis. I am for "one." L. J. CONOON.

Whitesville, Ind.

MESSRS. EDITORS:—I would like to ask you just "one" question about the "two" wheel problem. If you should slide (not revolve) the movable wheel entirely around the fixed wheel, would the movable wheel make a revolution, or any part of a revolution, upon its axis?

What a tempest you have raised upon this subject. The old and the young are in a jangle over it. The unmarried of uncertain ages still adhere to "one." The pretty young ladies declare they *must* be "won." Under your lead the "ones" have it. Their hope is in *you*, and, like Sumner, their cry is, "Stick," that "one"-ders may not cease.

Woburn, Mass. R. W. P.

MESSRS. EDITORS:—We have tried the wheel experiment repeatedly, looked at it in every possible light, and have finally come to the conclusion that you are right. This is the universal verdict of many persons here. To the superficial observer it would appear to make two revolutions, but upon trial I can readily see that the movable wheel makes but one revolution on its own axis, and one revolution around the center of the fixed wheel. T. D.

Mt. Lebanon, N. Y.

Bringing the Wheel Question to a practical issue:

MESSRS. EDITORS:—I have always held that a movable wheel makes but one revolution *on its own axis* in rolling once around a fixed wheel of the same size. I have borne the assaults and researches of the "two revolution" party with commendable patience. I have been kept out of bed until two o'clock in the morning quietly answering objections. My plate has been revolved until my pork and beans were cold. My biscuits have come to table lined and figured, evidently with a piece of burnt wood. Bridget has complained of a mysterious disappearance of sauce-pan lids. My sulky wheels have several times been removed. Yesterday, however, my equable temper broke down, when one of the "two revolutionists" brought the *moon* into the discussion. Now I take notice that when one calls the moon to his assistance he is in a bad case. For example, when a man tries to convince me that the moon is made of green cheese, he is a fool, or takes me for one. The old woman, who tried to dissuade her son from Sabbath breaking by citing the shocking example and punishment of the "Man in the Moon," was at fault both in religion and science. Messrs. Editors, that old woman is not dead yet. In short, I am a plain, matter-of-fact man, and consider all those kinds of celestial appeals, come they from professor or pedler, as mere moonshine.

This question can be brought to a practical issue: If a *whole* wheel makes *two* revolutions in rolling once around a fixed wheel of the same size, a *half* wheel must make *one whole* revolution in rolling half way around a fixed wheel of equal diameter. A corduroy road and a wheel-barrow having but a half wheel, will furnish the apparatus to try this on. See sketch, which explains itself.

Any one wishing to try the experiment may address

JOB STUBBS.

Practical Lodge, Western Wilderness.

Fig. 21.

WHEELER—"*Two* Revolutions, or *One?*"
WHEELER—"*Oh! ONE!*"

The Saline Springs of Onondaga, N. Y.

The brine from these springs results from water penetrating immense subterranean deposits of rock salt, made by the natural evaporations of salt water lakes, like the Great Salt Lake, Caspian Sea, etc., which lakes existed in geological periods millions of years ago, the basins forming them being afterward covered up by later deposits. They belong all to the upper silurian era, and are at such great depths that they are perhaps inaccessible to man, but the way the salt is obtained there is so economical that it is far superior to the quarrying done in dry salt mines; it is simply pumped up in solution through comparatively narrow and inexpensive tubes. When we take in consideration that most of the natural rock salt has to be dissolved, filtered, and recrystallized, we see here that nature has done the dissolving and filtering, in fact the brine in Syracuse is so clear that a simple evaporation, either by fire or solar heat, is sufficient to produce a superior article of table salt.

The state owns the springs, pumps up the water, chiefly by the water power of that part of the Erie canal passing through Syracuse, and sells the brine to the manufacturers of the salt. The total quantity of salt obtained in Onondaga county since 1797 is not less than 200,000,000 bushels, half of which was obtained during the last fifteen years. Each bushel contains 56 pounds of salt. Taking now in consideration that one cubic foot of solid salt weighs 140 pounds, 15 cubic feet make a tun. The amount of salt, therefore, removed during the seventy years that the springs have been in operation amounts to 5,000,000 tuns or 80,000,000 cubic feet of solid salt. This would form a single excavation in the earth of about 450 feet long, wide, and high; but the salt is not all removed in one breadth and the excavations are certainly distributed irregularly, over a large extent of subterranean territory. As the brine contains about 15 per cent of salt, it took seven times that amount of water to dissolve it; 560,000,000 cubic feet or 5,000,000,000 gallons of water have therefore all been evaporated by the heat applied during seventy years, and probably more, as the brines formerly used were not so strong by far as those obtained later by boring to a greater depth.

Editorial Summary.

GREEK FIRE.—In anticipation of further Fenian demonstrations, a memorandum relative to the treatment of nitroglycerin and Greek fire has been issued in England by order of the Home Secretary. Of the former explosive, the simplest mode of disposal recommended is to sink the containing vessels in deep water without attempting to open them. True Greek fire, it says, is simply a solid, highly-combustible composition, consisting of sulphur and phosphorus dissolved in the bi-sulphide of carbon, to which occasionally some mineral oil is added, with the view of increasing its incendiary powers. When the liquid is thrown on any surface exposed to the air, the solvent evaporates, leaving a film of the phosphorus or sulphide of phosphorus, which then inflames spontaneously. The proper mode of extinguishing such a fire is to throw damp sand, ashes, sawdust, lime, or any powder, wet sacking or carpeting, in short, any material which will exclude the air from the fire. No attempt should be made to remove the covering for some time after the flame has been extinguished. The place should afterward be thoroughly washed by a powerful jet of water forced upon it.

CONCERNING FROZEN POTATOES.—Dr. Adolph Ott, a frequent contributor to these columns, has been examining frozen potatoes for the purpose of confirming or disproving the truth of the common theory that the sweet principle of frozen potatoes is due to the conversion of starch into sugar. After a long series of experiments he concluded that this sweet principle was caused, during the freezing and thawing, by the sap bursting the cell and thus destroying vitality; at the same time decomposition sets in, which, though retarded by the cold, is not entirely arrested; the more so as at the season most likely to freeze, and especially during a snow storm, there abounds that powerful oxidizing agent, ozone. The outer portions, no doubt, are first attacked by it, and may thus be transformed into diastase, a body possessing the power of converting a comparatively large quantity of starch first into dextrine, and then, at the temperature of 140° to 170° as in the process of cooking, into sugar.

OBSERVING THE BESSEMER CONVERTER FLAME.—At the Atlas Steel Works, Glasgow, a very neat contrivance has for some time been used for enabling the observer to determine the point when the combustion of the carbon is completed. A square thin frame contains a combination of colored glasses, for instance, one dark yellow and two blue, or any other colors giving together a very dark neutral tint. Looking at the flame through these glasses affords the double advantage of preserving the eye from unpleasant effects of the intense light, and of making all smoke and other disturbing changes invisible. The flame, when thus viewed, looks white so long as the intense brilliancy due to the burning up of the carbon continues, but changes to a deep red at the moment all the latter has been consumed.

UTILIZATION OF SPONGY CELLULOSE.—In the process of making paper from wood, as practiced in Europe, round disks of wood are first subjected to the action of hydrochloric acid to dissolve out the spungy cellulose. This latter has, until lately, been a waste product, but is now converted into alcohol in this way: The wood is boiled for twelve hours in hydrochloric acid, diluted with ten times its volume of water. The acid liquid, which is charged with grape sugar formed from the spongy cellulose, is then withdrawn, the excess of acid saturated with lime or chalk, and a small quantity of yeast is added, the temperature being kept at about 68° Fah. Fermentation soon ensues, and when bubbles of carbonic acid gas are no longer evolved, the liquid is distilled to obtain the alcohol.

THE POISON OF RATTLESNAKES.—A Philadelphia physician, Dr. S. W. Mitchell, has been experimenting upon the venom of rattlesnakes, and concludes that there is no antidote to the poison, the remedies usually applied being nearly or entirely useless. Carbolic acid applied externally sometimes delays the result merely by affecting the local circulation. He has also confirmed the general belief that the poison is absolutely innocuous when swallowed, it being incapable of passing through the mucous surfaces; also that it is so altered during digestion that it enters the blood as a harmless substance. The venom is not injurious to the rattlesnake itself or to any other of its own species. The doctor attaches considerable value to large doses of alcoholic liquors, especially where the patient was not intoxicated at the time of being bitten.

SMOKE FROM GAS LIGHTS is not usually occasioned by impurity in the gas, but the evil arises either from the flame being raised so high that some of its forked points give out smoke, or more frequently from a careless mode in lighting. When we suddenly open the stop cock and allow a stream of gas to escape before applying the match, a strong puff follows the lighting and a cloud of black smoke rises to the ceiling. Daily repetition gives in time a blackened wall.

GARDINER, in his "Music of Nature," asserts that dogs in a state of nature never bark—they simply whine, howl, and growl. The Australian dog never barks, and Columbus found that the dogs he had previously carried to America had lost their propensity for barking. This peculiar explosive seems to be an acquired faculty, which the animal derives from his associations with man.

TIERS-ARGENT.—This beautiful white alloy, first made by Taloureau, consists of two thirds of aluminum and one third silver. It is now made perfectly homogeneous, and is easily fabricated. Its hardness and lightness are valuable qualities in table furniture. Spoons, forks, goblets, and salvers made of this material are rapidly coming into use in Paris.

LEUWENHOCK has computed that 100 single threads of a full grown spider do not equal the diameter of the hair of the beard, and when the young spiders begin to spin, 400 of them are not larger than one of a full growth, consequently 4,000,000 of a young spider,s threads are about the size of a single hair of a man's beard.

M. SALVERTE, in his work on the occult sciences, shows the probability that the ancients defended their buildings from lightning by conductors, and that the Temple of Solomon was thus protected.

MANUFACTURING, MINING, AND RAILROAD ITEMS.

A bill to incorporate the Idaho, Oregon and Puget Sound Railroad Company has been introduced in Congress, petitioning for power to build a railroad from a point on the Union Pacific 115° 30' west longitude, north to Snake river valley, thence northwesterly to Columbia river valley, thence to Portland, Oregon, and finally to Puget Sound. The company ask for every alternate section of public non-mineral lands to the amount of twenty alternate sections per mile on each side of the railroad line; also, United State bonds to the amount of $16,000 and $32,000 per mile for level and mountain routes respectively. A branch road is to extend to Montana.

One of the furnaces of the Crane Iron Company, at Catasauqua, Pa., lately turned out two hundred and forty tuns of iron in one week; a yield scarcely ever equalled in this or any other country.

The only coal mines which last year were worked within the limits of the Pacific territory, were those of Bedlingham Bay and Monte Diablo, while the amount extracted was but 8,816 tuns from the former, and 71,322 from the latter, making a total of 80,138 tuns, against a product during the preceding year of 90,000 tuns. At the Monte Diablo mines increased facilities for transportation to tide water have been created by the construction of railroads, and it is expected that the beneficial results of these improvements will be felt another year.

A well of naphtha has been discovered at Kudaca, in the Caucasus, by boring. The liquid was first struck at a depth of 274 feet from the surface, and the yield for several weeks was at the rate of 1,500 barrels a day. Since then a fresh source has been met and a jet of naphtha, four inches in diameter, rises with great force to the hight of forty feet above the ground, affording a supply of 3,000 barrels daily.

The famous Thames tunnel, which for the twenty-five years since its completion has proved an indifferent speculation, is at last to be made of some practical use. It is stated that two railroads on opposite sides of the river propose forming a junction by means of this subaqueous passage-way, and will make gradual entrances a mile distant from either bank. The original cost of the tunnel was over $2,000,000. It was sold a few years ago for one half that amount, and even at this sacrifice the purchasers have found it to be a very unfortunate investment, the receipts, principally toll from foot passengers drawn thither by curiosity, averaging but $135 per week, which have been entirely consumed by expenses. Under the railway management, the tunnel may possibly become a pecuniary success.

The manufacture of salt commenced in the United States at Syracuse, in the year 1797, since which time this locality has produced eighty millions of bushels. Last year's yield amounted to 10,000,000 pounds, or about two thirds of all the salt consumed in this country. A correspondent writes that salt of excellent quality is manufactured in Oneida county, Idaho Territory.

The citizens of Minneapolis are very much concerned over the unpleasant fact that the Falls of St. Anthony are receding up stream at the rate of three hundred feet per year. All efforts to prevent this stampede of the rapids, by protecting the ledge, have proved insufficient, and the inhabitants are fearing the total destruction of the water power upon which their prosperity depends, and the consequent degeneration of the city to the rank of a mere village.

The iron and steel works at Birmingham, Conn., used 4,000 tuns of scrap last year, making 3,500 tuns of finished iron, 350 tuns of imported steel in carriage and truck springs, and made 1,000 tuns of iron into axles of all grades and styles.

MM. Carver & Co., of St. Etcinne, France, have successfully utilized the gases given off in converting bituminous coal into coke. These gases are collected, drawn off into pipes, and cooled. From the liquids, condensed benzine, naphtha, sulphate of ammonia, and several dyestuffs are made; the uncondensed gas is used for illuminating purposes.

An establishment in Vienna manufactures knives from tungsten steel, which are so hard as to cut glass like the diamond.

A singular gas explosion in an oil well is reported in the Titusville *Herald*, the like of which, it says, has never been known in the oil regions. While drilling an oil well, near Enterprise, the tools broke through the second sand rock into a crevice where an immense quantity of gas had collected. Thus liberated, the gas rushed out with a loud rumbling sound, tearing out the driving pipe and throwing it upward into the derrick. A loud explosion ensued on the gas becoming ignited from the fire in the engine, and the derrick and engine house were both destroyed.

The manufacture of starch from potatoes is extensively carried on in the Northern and Eastern States. A single firm in New England consumed 25,000 bushels of potatoes for this purpose in 1867.

Recent American and Foreign Patents.

Under this heading we shall publish weekly notes of some of the more prominent home and foreign patents.

WATCHES.—George Frederick Roskopf, Chaux de Fonds, Switzerland.—This invention relates to an improvement in the construction of watches, which consists in having that portion of the mechanism of a watch known as the "escapement," fitted or attached to a plate or frame separate from the frame in which the "train" or other portion of the movement is fitted, the plate or frame to which the escapement is fitted being attached to the frame of the train in such a manner that it may be readily detached when necessary, and any of the known escapements, on a similar detachable plate or frame fitted or applied to the other portion of the movement. It also consists in constructing the detachable plate in such a manner, or arranging the several parts comprising the escapement on said plate in such a way that the 'scape wheel may be readily adjusted in a proper relative position with the pallets or other part or parts which work in contact with the teeth of the 'scape wheel, the detachable plate being secured to or in the frame which contains the train, or part of the watch movement, in such a manner that it may be adjusted so that the pinion on the 'scape wheel axle may always be adjusted properly in gear with the wheel of the train in which it is designed to work.

MANUFACTURE OF HATS, CAPS, BONNETS, NECKTIES, AND RIBBONS.—Trefle Garceau and Edward de la Granja, Boston, Mass.—This invention consists in combining paper pulp, india rubber, and paraffine in certain proportions, and thereby forming a composition peculiarly adapted to the manufacture of hats, caps, bonnets, neckties, ribbons, and other similar articles.

CULTIVATOR TOOTH.—M. F. Lowth and T. J. Howe, Owatonna, Minn.—In this invention the tooth is hinged, and provided with a brace, by which the angle of the tooth with the ground can be regulated, and which also operates to prevent the breaking of the tooth or beam by obstacles in the way of the cultivator.

ANIMAL TRAP.—Major B. Marshall, Draw Bridge, Md.—This improved trap is designed particularly to catch animals that travel in paths or leads, and the invention consists in so constructing it that it can be more easily sprung, and will more effectually secure the animal than will the traps hitherto in use.

FLUID METER.—Leicester Allen, N Y city.—In this invention a piston is balanced by a spring in such a manner that the piston, actuated by the flow of the water, will open a valve and give free passage to the water as long as there is no back flow, and when there is any back action will close, or partially close the valve and stop the flow. A registering apparatus records the amount that has passed through the valve.

COTTON SEED PLANTER.—A. J. Going, M. D., Clinton, La.—This invention relates to a machine for planting cotton seed, and consists in a peculiar construction and arrangement of parts pertaining to the seed-distributing apparatus, whereby the seed may be sown with certainty and without the liability of the hopper becoming choked or clogged. It also consists in using in combination with the seed distributing apparatus above alluded to a furrow opener and seed-covering device.

HOLDER FOR RAZOR STROPS.—George Scott, Steubenville, Ohio.—This invention relates to a holder for razor strops, and to the manner of securing the strop thereto, and consists in making the holder of a metallic spring band, curved or bent in the direction of its length, within the strop, extended between its two ends and there secured, at its full tension or thereabouts, and also in so bending the ends to the band that the strop can be secured thereto without the use of rivets or any additional fastening devices of any nature.

KNITTING MACHINE.—Henry Bögel, Watertown, Wis.—This invention relates to a knitting machine for making plain knit fabrics of any number of stitches. It is of very simple construction, works almost without any noise, and can be easily taken apart for the purpose of removing or replacing needles, and for repairing and cleaning the whole machine. Two sets of needles, each working independently of the other, are arranged in the machine, of which both or either one may be operated at a time, and thus one or two pieces of fabric may be knit at once.

WIND WHEEL.—Wm. C. Day, Mohawk, N. Y., and P. B. Day, Shelby, Mich. This invention relates to a wind wheel of that class in which vertical wings or sails are employed, and the wheel enclosed within a box provided with doors, by opening or closing which more or less wind is admitted to the wheel, and the speed of the same regulated as desired, and by closing the doors the motion of the wheel entirely stopped. The invention consists in the application to the doors of the box which encloses the wheel, of a chain or cord connected with a windlass, and arranged in such a manner that by operating the windlass all the doors of the box may be opened and closed simultaneously, and the wheel kept running at a uniform speed, or stopped entirely, when required, with the greatest facility.

SUBSOIL ATTACHMENT FOR PLOWS.—Charles Hayden, Collinsville, Conn.—This invention relates to a mode of attaching a subsoil plow or share to an ordinary plow, whereby the share may be adjusted, raised, or lowered, with far greater facility than hitherto,—readily detached when not required for use, so that the plow to which it is applied may be used as an ordinary plow, be simple in construction and capable of being manufactured at a small cost, and be of light or easy draft.

FOLDING BOW DISH FOR SPRING BALANCES.—Richard Murdock, Baltimore, Md.—In this invention the dish or platform upon which the articles are placed to be weighed by a spring balance is supported at its four corners by arms bowed or curved outward and so arranged that they can be readily fixed in position or not, and when not in use, can be folded together upon the dish so as to occupy but little room.

FRAME FOR HOP VINES.—Abram Shoemaker and Wallace Phelps, Connesville, N. Y.—This invention relates to a useful improvement in the construction and arrangement of frames for training hop vines.

HOP PICKING TOOL.—John Dean, Baraboo, Wis.—This invention relates to a new device for picking hops from the pole, and consists in the use of a rake with curved tines and with cutters at the ends which serve to cut the vines as the tool is drawn along the pole.

HYDRANT FIRE PLUG.—T. B. Bailey, Jr., Lockport, N. Y.—This invention relates to a method of constructing fire plugs or hydrants, and the invention consists in operating a cylinder valve in a suitable case and in the arrangement and combination of parts connected therewith.

MACHINE FOR COILING SPRINGS.—John Freeland and Daniel Ward, New York city.—This invention relates to a machine for coiling patent volute and other similar springs while hot, and consists in a frame constructed with head and tail blocks like a turning lathe having suitable driving gear and an adjustable spindle or mandrill around which the spring is coiled.

BRIDGE.—Frederick H. Smith, Baltimore, Md.—This invention has for its object to improve the construction of bridges so that any desired part of the bottom chord can be readily adjusted to tighten or loosen any desired part of the bridge or to allow any desired part of the woodwork to be removed and replaced.

ANGULAR SHAFT COUPLING.—John M. Case, Athens, Ohio.—This invention has for its object to furnish an improved coupling or gearing for connecting shafts to each other at any desired angle which shall be so constructed and arranged as to securely couple the shafts, run with less noise, and with less friction than the ordinary bevel gearing, and which shall at the same time require less material for its construction.

SASH BEAD FASTENER.—Daniel W. Dyer and James H. McVaugh, Philadelphia, Pa.—This invention has for its object to furnish an improved means for removably securing sash beads to the casing which shall be simple in construction, easily attached, and easily operated.

LUBRICATING BOX FOR CRANKS, ETC.—T. J. Rowley and Wm. Poland, Chillicothe, Ohio.—The object of this invention is to feed the oil for lubrication of cranks, crank pins or wrists, and journals, in stationary bearings.

ROLLING IRON, ETC.—W. P. Porter, Pittsburgh, Pa.—This invention relates to an improvement in rolling iron and other metals in the form of railroad axles and other metal bars.

ANVIL CUTTER.—Valmore A. Dunn, West Peru, Me.—This invention relates to an anvil cutter, and consists in a pair of shears one jaw of which is fixed by an arm with a block or anvil, and the shears are thrown open by a spring.

BASIN WATER COCK.—Robert P. Ross, Bethlehem, Pa.—This invention consists in arranging a drop valve with an elastic face which is operated by a screw whereby all leakage is prevented.

WELL BORER.—George W. Bowen, Fort Wayne, Ind.—This invention relates to an implement for the boring or sinking of wells in quicksand, or for cleaning out wells; it is of such a construction as to enable the work to be done with great rapidity, facility, and safety, and in the most satisfactory and perfect manner.

COTTON-BALE TIE OR HOOP LOCK.—E. S. Roberts, Columbus, Ga.—This invention consists of a metallic box of quadrilateral form, having an open outer side to receive the ends of the hoop, which are bent so as to form loops through which and the sides of the box metal pins pass and firmly connect the ends of the hoop together, the box, under the expansion of the bale when relieved of pressure, sinking into the bale so that the ends of the hoop, which are secured in the box, will not project out beyond the side of the bale.

IRON AND STONE RAILROAD TRACK.—Dominicus N. Clark, Eastport, Me.—This invention has for its object to furnish an improved railroad track, superior to those now in use in durability and safety.

SCHOOL DESK.—Rev. R. Cruikshank, Lawrenceville, N. J.—This invention has for its object to improve the construction of the school desk patented by the same inventor May 24, 1864, and numbered 42,839, so as to make it more convenient and satisfactory in use.

CAR MOVER.—H. B. Morrison, Le Roy, N. Y.—This invention has for its object to furnish an improved machine by means of which freight cars may be easily moved about in the freight house, for convenience in loading or unloading them.

DOVETAILING MACHINE.—Robert Wolt, Burlington, Iowa.—This invention relates to a machine for dovetailing the side pieces as well as the front and back pieces of drawers, boxes, and other articles, and consists of two parts, one for sawing the side pieces and the other for chiseling the front and back pieces.

PHOTOMETER.—H. Vogel, Berlin, Prussia.—The object of this invention is to determine with exactness the time required for copying photographic negatives.

CUTTING AND CARVING MACHINE.—Isaac Hall, New York city.—This invention has for its object to furnish an improved machine by means of which any desired design or pattern may be cut or carved upon ivory, wood, stone, metal, or other suitable substance.

PETROLEUM STOVE.—Daniel Kellogg, Jackson, Mich.—This invention relates to a stove for burning petroleum or other inflammable oils or fluids, and consists of a tripod base supporting a burner within a chamber provided with a bottom dish for adjusting the supply of air, a lateral damper and a disk of radial wings, the latter being situated immediately over the flame, for aerating the same and causing the more perfect oxidation of its carbonaceous particles.

CRIBBING PREVENTER.—Ben. J. Davis and Isaac S. Cramer, Sergeantsville, N. J.—This invention relates to an attachment for bridles, for the purpose of preventing horses from indulging in the vicious and hurtful habit of cribbing, so called. It consists of a pricking point inclosed and guarded by a cylindrical cap working within a larger cylindrical base, to which it is attached by a telescopic point. The two cylindrical parts inclose the pricking point, which is firmly seated in the throat strap, and presents its point through a central hole in the cap when the latter is pressed against the tension of a spring which otherwise keeps the cap out and over the pricking point.

DREDGING SCOOP.—Harris W. Thornburg, Shelbyville, Ind.—This invention refers to a scoop which is particularly designed for cleaning out wells and sinks, but may successfully be employed for other purposes where the conditions of operation are of the same nature. It consists of a scoop formed in two equal parts hinged together and so attached to ropes or chains that the scoop can be lowered into a well or sink in such position that the lower edges of the parts will encounter the bottom of the well, and when the lifting rope is drawn these parts will be brought together, thus scooping up a portion of the bottom on which they rested.

HAT BUCKLE.—J. A. Burton, Senoia, Ga.—This invention relates to a buckle for hat bands, and its object is to so arrange it that railroad or other tickets can be firmly held by the same, and can, whenever desired, be easily removed therefrom.

BEDSTEAD FASTENING.—J. E. Milliken, Bridgeton, Me.—This invention relates to a method of securing the rails to the posts of bedsteads, so that they are more easily taken apart or moved, and rendered more secure. It consists of a metallic hinge attached to the side rail of the bedstead, the pivot of which may be easily removed, and upon which the post is turned upon the side rail. It consists, also, in a hook and staples, by means of which the post is secured to the rail in an upright position.

WHIP LOCK.—Francis M. Gifford, Erie, Pa.—This invention relates to a method of constructing locks for securing the whip within the socket by an attachment independent of the socket itself, whereby the whip cannot be moved from the socket without the key. It consists of two metallic arms provided upon each end with jaws, the upper side of one of the arms having a nut, the other a socket, this socket having a nut, and the nut a thread to receive a screw by means of which the jaws are drawn or forced together the head of the screw being so constructed and concealed so that only a key of a peculiar construction will unscrew or unlock the jaws, and loose the whip from the socket

CORN PLANTER.—William Daggett, Cordova, Ill.—This invention relates to a method of constructing hand corn planters, whereby corn is more rapidly and economically planted. It consists of a planter composed of three chambers, through which slides a plunger provided with a valve by means of which the required quantity of corn is carried from one chamber to another, and finally to the ground. Also, in the bottom of the under chamber, being formed of steel or other elastic substance, which closes the outlet of the same, until the plunger in the downward movement of the same forces the corn upon the said springing bottom through the outlet into the ground, whereby the required quantity of corn for a single hill is always in readiness to be forced into the ground at the next downward movement of the plunger.

PAPER "LINEN."—B. M. Smith, No. 4 Dey street, New York city.—The manufacture o paper collars and cuffs, scarcely yet fifteen years old, has been carried to a perfection, while the consumption has risen to a magnitude, of which few persons have any conception. These articles, every one of which, of course, is thrown away as soon as soiled, are made and used up in the United States by hundreds of millions every year. Three or four hundred manufactories are in operation, some employing a capital of no less than $500,000, and thirty or forty paper mills run constantly on paper of the various qualities required. The styles in which collars and cuffs are manufactured of paper, for both sexes, are as varied, and some of them as elaborate and beautiful, as those made of linen and lace. The best substitutes for linen collars and cuffs are exquisitely stitched and corded at the edges (in appearance), and are even made to imitate exactly the surface of a starched and ironed linen fabric. Their chief imperfection has been the lack of strength in the button-holes, which are often torn out in the first attempt to put them on, and still oftener fail to serve a second day. For this defect a variety of remedies have been tried one of the best of which was the combination of two thicknesses of paper with an intermediate layer of coarse linen. This gave all the strength desired, but doubled or tripled both the cost and the clumsiness of the article. A cheaper but less effective expedient is adopted by some manufacturers, who paste a small patch of linen under the place of the button-hole. Most of these goods, however, are punched without any strengthening whatever. We have just been shown a novel specimen, having a perfect button-hole, durable enough for a hundred buttonings and unbuttonings, yet not appreciably increasing the cost of manufacture. Indeed, it is said that the machinery to be employed will turn them out cheaper than ever. The improvement consists in binding the edge of the rounded end or eye of the button-hole with a delicate film of silvered metal, not over one thirty-second of an inch broad, and so thin as not to increase the thickness of the paper edge, into which it is stamped with a minute bead to hold it immovably in place. The open ends of the metallic edging are each brought to a point and turned backward into the paper, so as not to catch and tear out. The button-hole works freely and flexibly; and never tears. This is a smaller invention than the wire connections for Venetian blinds, and like many a small thing, will be among the most profitable of improvements for the inventor.

Answers to Correspondents.

CORRESPONDENTS who expect to receive answers to their letters must, in all cases, sign their names. We have a right to know those who seek information from us; besides, as sometimes happens, we may prefer to address the correspondent by mail.

SPECIAL NOTE.—This column is designed for the general interest and instruction of our readers, not for gratuitous replies to questions of a purely business or personal nature. We will publish such inquiries, however when paid for as advertisements at $1 00 a line, under the head of "Business and Personal."

☞ *All reference to back numbers should be by volume and page.*

A. G. F., of Ohio, is running a saw and grist mill combined and the end of the main shaft to which the saw gate is attached thumps every time the gate is about half way coming down. The shaft is in line and the top box of the end journal has been screwed down until it heated but all to no avail. We think our correspondent will find, on examination, first, that the cap does not have a bearing on the box; second, that the interior of the box, as a whole, does not show a complete circle in cross section, but an ellipse. The box should be of the exact diameter of the shaft, and no box, especially one for a shaft subjected to reciprocatory motion should be left partly open.

W. L. B., of Mass., asks what is the composition of the glossy black paint used in lettering show cards. Lampblack from which the oil has been burned by roasting is the basis and may be used by mixing with the whites of eggs, which makes a very brilliant paint, or varnish, turpentine, and japan may be the vehicle.

A. S. S., of Mich.—The information you require in relation to atmospheric currents can be obtained from Espy's "Theory of Storms" or Maury's "Physical Geography of the Sea," and other meteorological works.

S. J., of N. J.—"How many pounds of steam pressure is equal to 120 pounds cold water pressure?" 120 pounds pressure is that and nothing else whether created by steam or water. Probably, however, our correspondent wants to know how much steam may be safely carried on a boiler which has had a hydrostatic test of 120 lbs. The general practice is to reduce one fourth, which would give a steam pressure of nearly 100 lbs.

F. G. S., of Mass.—Your theory of the explosive quality of non-aerated water in a steam boiler is not new, and it has heretofore been quite extensively discussed in our columns. Devices for forcing air into the water are in use, but we more strongly approve of your advice to blow off oftener.

R. M., Jr., of Canada, asks for a recipe for opaque glue. Boil ordinary glue with very fine bone dust. This correspondent also says that a friend from Spain left with him, last summer, a quantity of clay, called *terra de vino*, used in Spain for clarifying wine, which it did excellently well also in Canada. It will also remove grease and other stains from cloths. He offers to send a sample. We shall be glad to have him. Perhaps we will analyze and test it.

P. G., of N. Y.—"Why is the sun's center on the meridian ever back of the clock?" Because of the elliptical orbit of the earth and the inclination of the earth's axis to the ecliptic.

W. P. T., of N. J.—"Is there any coating or solution which will cause brass wire to permanently resist the action of carbonic acid?" Yes; electroplating or gilding.

S. B., of Mass.—We know of no liquid solution equal to good glue for immediately and permanently uniting two pieces of cotton webbing. If it will unite leather belts, subjected as they are to enormous strain, it certainly should answer for a cotton fabric.

C. W. D., of Md.—We believe there are tables of latitude and departures calculated for the quadrant in some treatises on surveying but cannot name them. Send to D. Van Nostrand, 192 Broadway or to John Wiley & Son, 535 Broadway, New York city.

W. R. W., of N. H.—This correspondent asks, "which way should a fly wheel run having curved arms, in the direction that the arms crook or the opposite?" With the letter comes a drawing representing a wheel with the ordinary curved arms so frequently used on pulleys, fly, and other wheels. We presume that it makes, practically, little difference which way the wheel turns, as the arms are usually slight and their cross section is of oval or lozenge form; but, preferably, we have always in practice presented the convex side of the curve to the line of motion, the result of which, if any, would be to direct the air impinging on the arms to slip or slide off toward the rim of the wheel.

G. S. D., of Tenn., asks how to deposit pure iron on iron or steel by the battery. In one or two of our back numbers we described or alluded to the process. We presume that there is no secret in the matter. Those who understand the deposition of metals by the battery will probably find no peculiar difficulties in the management of iron.

R. S. T., of Mass.—"I have observed that in 'blowing off,' the steam pressure, by the gage, does not lessen perceptibly until the water is all or nearly all blown out of the boiler. Now if the steam that was in the boiler has to fill its own and also the space occupied by the water, why, as the water blows out, does not the steam pressure proportionally diminish?" Our correspondent is wrong in two of his above assumptions. For an understanding of the matter, for the details of which we have no room, we refer him to "Heat, Water and Steam," by Charles Wye Williams, published by Henry Carey Baird, Philadelphia, Pa.

E. C. J., of Conn.—"What will remove superfluous hair from the face without injuring the skin?" We know of no chemical preparation having those qualities. The razor or tweezers will do best.

R. R. M., of Cal.—"What is the recipe for japan for iron work. That which I have tried is not so hard, smooth, and durable as I would like." We give Cooley's recipe for black japan, which, however, may have been improved upon by practitioners, to whom our correspondent had better apply for information. Cooley says, "burnt umber, 8 oz; pure asphaltum, 3 or 4 oz.; boiled linseed oil, 1 gallon; grind the umber in a little of the oil; add the asphaltum, previously dissolved in a small quantity of the oil by heat; mix, add the remainder of the oil, boil, cool, and thin with a sufficient quantity of the oil of turpentine. It is flexible."

R. D., of Conn.—"How are saws straightened?" Simply by judicious hammering. It requires an expert to do it, but an experienced hand can straighten the most crooked saw. All saws have to be straightened, by hammering, after being hardened.

I. L., of Ind.—"What amount of water per hour is required per horse-power to run an ordinary steam engine?" One cubic foot per hour per horse-power is the general rule, modified, of course, by the condition of engine, at what point it cuts off, etc.

J. C., of Pa.—"Our large leather drying loft is heated by steam, the pipes fed by an inch pipe with a return pipe of the same diameter discharging into our engine exhaust pipe. Can we get as much heat with the return pipe wide open as partially closed?" Have your "return" or exhaust wide open to get the full heat. Is not live steam hotter than condensed, or than warm water?

J. S., of Iowa.—Like others, this correspondent has experienced difficulty in the management of his feed pump for a steam boiler. He proposes to build an elevated water heater or tank, connecting with a supply tank at a lower elevation—the bottom of the first being on a level with the top of the latter—a steam pipe leading from the boiler to the upper part of the supply tank, and a water pipe leading from its bottom to the water space of the boiler. (The plan is illustrated by a diagram we do not think it necessary to reproduce.) Our correspondent thinks it would save power. In reply we would say that a boiler *may* be fed by this device. Several patents have been granted within the past thirty-five years for boiler feeders involving the principles in various forms. We have never investigated their practical workings; but, from the fact that none of them have come into general use we infer that they are not reliable feeders, *under all circumstances.*

J. A. G., of Me.—"How can I cut a piece of glass five eighths of an inch square into sections of one eighth thick?" By employing a practical glazier, skilled in the use of the diamond to do it for you.

J. O. L.—The use of sponge for mattresses is old.

Business and Personal.

The charge for insertion under this head is one dollar a line.

EXTENSION NOTICES.

John Brown, of New York city, having petitioned for the extension of a patent granted to him the 30th day of May, 1854, for an improvement in hot water apparatus, for seven years from the expiration of said patent, which takes place on the 30th day of May, 1868, it is ordered that the said petition be heard at the Patent Office on Monday, the 11th day of May next.

Thomas T. Jarrett, of Horsham, Pa., having petitioned for the extension of a patent granted to him the 30th day of May, 1854, for an improvement in hay elevators, for seven years from the expiration of said patent, which takes place on the 30th day of May, 1868, it is ordered that the said petition be heard at the Patent Office on Monday, the 11th day of May next.

Levi Dederick, of Albany, N. Y., having petitioned for the extension of a patent granted to him the 6th day of June, 1854, for an improvement in hay presses, for seven years from the expiration of said patent, which takes place on the 6th day of June, 1868, it is ordered that the said petition be heard at the Patent Office on Monday, the 18th day of May next.

Charles F. Martine, of Boston, Mass., having petitioned for the extension of a patent granted to him the 6th day of June, 1854, and reissued the 26th day of December, 1855, and again reissued the 27th day of August, 1867, for an improvement in sofa bedsteads for seven years from the expiration of said patent, which takes place on the 6th day of June, 1868, it is ordered that the said petition be heard at the Patent Office on Monday, the 18th day of May next.

Edward Harrison, of New Haven, Conn., having petitioned for the extension of a patent granted to him the 6th day of June, 1854, and reissued the 16th day of November, 1856, for an improvement in grinding mills, for seven years from the expiration of said patent, which takes place on the 6th day of June, 1868, it is ordered that the said petition be heard at the Patent Office on Monday, the 18th day of May next.

Jacob Sennoff, of Philadelphia, Pa., having petitioned for the extension of a patent granted to him the 18th day of July, 1854, for an improvement in weavers' heddles, for seven years from the expiration of said patent, which takes place on the 18th day of July, 1868, it is ordered that the said petition be heard at the Patent Office on Monday, the 29th day of June next.

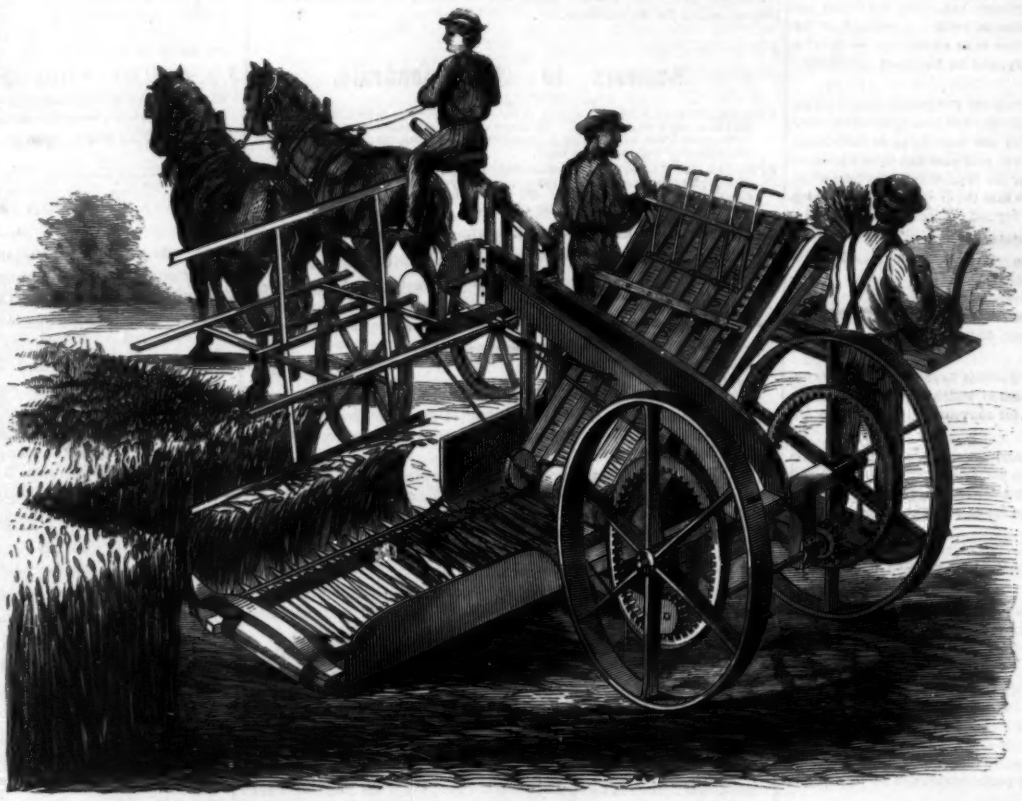
Jacob Sennoff, of Philadelphia, Pa., having petitioned for the extension of a patent granted to him the 22d day of August, 1854, for an improvement in machines for casting metallic eyes, or mails of heddles for looms, for seven years from the expiration of said patent, which takes place on the 22d day of August, 1868, it is ordered that the said petition be heard at the Patent Office on Monday, the 3d day of August next.

Caleb Swan, executor of the estate of Daniel Hayward, deceased, of Easton, Mass., having petitioned for the extension of a patent granted to the said Hayward the 29th day of August, 1854, for an improvement in manufacture of india-rubber, for seven years from the expiration of said patent, which takes place on the 29th day of August, 1868, it is ordered that the said petition be heard at the Patent Office on Monday, the 3d day of August next.

Improved Self-Delivering Harvester.

This machine differs from other self-delivering harvesters in depositing the gavels on a table or platform, instead of the ground, and in carrying the binders on the machine, their work, as seen in the engraving, being done with the body in an upright position, involving much less labor and fatigue than when the binding is done in a stooping posture. The driving wheels are four feet in diameter, making the draft quite light. From the main wheels the motion is given to the cutters, in the usual method, by means of internal gears, pinions, and bevel gears, one of the latter of which is on the cutter bar crank shaft, which crosses the machine at a point between the two main wheels. From this crank shaft the vibrating connecting rod that drives the cutters, runs to the further or outer end of the cutter bar, giving thus a long connection with much less friction, wear, and tear than when the connection is short.

The binders stand on a footboard suspended at one end from the axletree and resting at the other on the finger bar. They stand back to an endless apron or carrier, by which the grain is carried from the finger-bar platform to a table in front of the operators. The endless apron passes over a roller at the outer end of the finger bar, and then horizontally the length of the cutters to the cross crank shaft, rollers upon which hold it in place and guide it in an inclined direction to a roller at the top of the machine, the roller being driven by pulley and belt from the crank shaft. The inclined portion of the endless apron is covered by a guard of wooden slats, the grain being carried by the apron under these slats, which are pivoted to the crank shaft and may be made to rise and fall according to the quantity of grain that is passing up.



EMMERT'S COMBINED HARVESTER AND MOWER.

The table, upon which the grain is delivered, is made to slide transversely across the machine on a track which is slightly oval or inclined from the center to each end. This is designed to be moved by the binders, giving each an alternate gavel, and when slightly pushed, runs on its inclined track without assistance. There is a stop of hooked rods secured to the upper part of the guard, which, by rungs on the sliding table, is raised or lowered as desired. When the table is being moved from one operator to the other, this stop is down, the hooked ends preventing the delivery of the grain until the table is in position, when they rise and allow the grain to pass. The reel for holding the grain to the knife is driven by a belt from one of the main wheels.

The seat of the driver is a saddle on a pivoted lever, the seat being arranged to be moved toward or from the end of the lever. The weight of the driver can thus be utilized to balance that of the finger bar and its appurtenances, and to accommodate that portion of the machine to inequalities of surface.

As a mowing machine, the endless apron, carrier, and binders' platform can be removed in a few minutes, as also the double divider, when it becomes a complete and effective mowing machine.

Patented through the Scientific American Patent Agency, Jan. 28, 1868, by Ezra Emmert, who may be addressed on the subject of territorial rights or for other information, at Franklin Grove, Lee county, Ill.

Improved Apparatus for Punching Shoe Uppers.

The machine illustrated in the engravings is intended for punching the eyelets or string holes in shoes, and the apertures for the tongues of buckles for straps harnesses, etc. It is simple, elegant, and easily adapted to any required curvature of the work. It can be operated by any person of ordinary intelligence; even a child of ten years of age can work it with ease.

Fig. 1 shows the power, a toggle joint, adjusted by a nut and screw, A, so that the punches, B, are prevented from cutting into the copper bed, C, after they have passed entirely through the leather to be punched, thus protecting the punches from any unnecessary wear and tear.

Fig. 2 shows the arrangement of the punches, B, which by the use of a key on the axes of the screws, D, are moved to any position required, so as to correspond with the shape of the shoe to be punched. The machine is set for use by drawing the punches, by the use of the key, to the edge of the patterns, from which the shoe itself has been cut, and setting the stops, three of which are seen under the punches, so that these will cut at the proper space on the upper of the shoe to be punched. By this the holes in the shoe will be found to be on a perfect line from the edge, and of equal distances apart.

The upper part of the shoe is placed under the puncher, B, or rather upon the bed, C, and gently pushed up to the stops. The lever is brought down by the foot, and the work is done.

The engraving shows twelve punches, but the number can be increased or diminished; twenty-four can be used at one time, as well as three or four only. For small sizes of children's shoes, a supplementary set of punches, placed to act nearer together, may be used. There are several other claims contained in this patent, which may be used, but the inventor has thought best to have the machine as simple as possible in its operation, and at the same time a strong and perfect machine. For punching harness and skate straps, it is only necessary to set the punches in a straight line. Patented through the Scientific American Agency, Oct. 30th, 1866, by J. H. Keating. The entire patent for sale. Address P. K. Holbrook, 135 Federal street, Boston, Mass.

Fig. 2

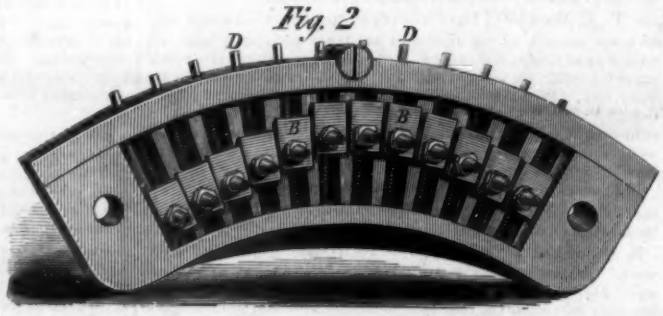


Fig. 1

KEATING'S ADJUSTABLE GANG PUNCH

A New Invention in Gas Illumination.

M. Bourbouze, a French physician, has lately contrived an ingenious apparatus, which will undoubtedly be received with great satisfaction by all those who take interest in improvements in gas illumination. In presenting his invention to a learned society in France, it was done with a view to facilitate the experiments with the solar microscope, in the courses of public instruction; but to-day we are led to believe that it will have a more general application. It is well known that is was proposed, some time since, to substitute for the ordinary gas light the more intense Drummond light, which is produced by introducing a piece of quick lime or magnesia into the flame of a mixture of oxygen and street gas. The effects thus obtained surpass those of the latter so considerably, that this mode of creating light, in regard to the illumination of cities, was doubted the less the more progress chemistry made in the manufacture of oxygen gas. M. Bourbouze has now constructed an apparatus which does away entirely with the preparation of oxygen, affording at the same time a great economy in regard to the quantity of gas employed. The former is substituted by atmospheric air, the practical arrangement for effecting the combustion being the following: The gases are admitted into one common tube, from thence they pass through a sheet of metal, perforated with a great many holes, in order to be divided into many small jets; these are delivered through a gauze of platinum wire, when they are lighted. The metal, in being heated, soon becomes red, then white, and thus diffuses a dazzling light. Experiments have shown, that, with a tension of 15 inches mercury, 1,308 cubic yards of gas are consumed per hour, the light emitted being equal to that of seven lamps of Gilbert. With a pressure of 7 4-5 inches, 45 cubic inches are burned per hour, they giving a light of four lamps of Gilbert. In employing low carburetted gas, this process will be still more economical. We are informed that some places in Paris will be illuminated in the mode described.

Pickling Brass.

The work, to be brightened and colored, is first annealed in a red hot muffle, or over an open fire, allowing the cooling to extend over one hour; the object of the heating being to remove the grease or dirt that may have accumulated during the process of fitting. Soft soldered work, however, must be annealed before fitted together, and afterward boiled in a lye of potash; this is also done with work having ornamental surfaces. Next, it is immersed in a bath of diluted oil of vitriol or aquafortis, which may be made with two or three parts of water, and one of acid; but the old acid that contains a small quantity of copper, in solution, is frequently preferred. The work is allowed to remain in this liquid for one or two hours, according to the strength of the acid; it is then well rinsed in water, and scoured with sand, which is applied with an ordinary scrubbing-brush, and washed. The "pickling bath" is made by dissolving 1 part of zinc in 3 parts of nitric acid of 36° Baumé, in a porcelain vessel, and adding a mixture of 8 parts of nitric acid, and 8 parts of oil of vitriol. Heat is then applied, and when the liquid is boiling, the work is plunged into it for half a minute, or until the violent development of nitrous vapors ceases, and the surface is getting uniform. Then it is plunged into clean water, and well rinsed, to remove the acid. The ordinary, dark grayish, yellow tint, which is thus very often produced, is removed in immersing the works again in aquafortis for a very short time. Then they are plunged into clean or slightly alkaline water, well rinsed to remove the acid, and plunged into warm dry beech or boxwood sawdust, and rubbed until quite dry. To prevent the action of the atmosphere they are lackered; if a green tint is to be produced, the lacker is colored with turmeric. A dark, grayish, but agreeable tint, is obtained by immersing the work previously in a solution of white arsenic in hydrochloric acid, or in a solution of bichloride of platinum, under addition of some vinegar, or rubbing with plumbago.

A PIECE of lace has been woven by a native of India, ten yards long and one yard wide, weighing but 3 oz. 2 dwts., and which could easily be passed through a very small finger ring.

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NEW YORK, SATURDAY, MARCH 28, 1868.

Contents:

(Illustrated articles are marked with an asterisk.)

IS THE CAREER OF CHOLERA ENDED?

Two hundred years ago there were two great pestilences which from time to time smote the human race with sudden and wide-spread destruction, hurrying vast numbers to untimely graves, and filling the hearts of survivors with unspeakable terror. One of these was the small pox, the other was called the plague. The small pox yet lingers among us, and the plague is still well known in the southern countries of Europe, but both diseases have ceased their ravages as epidemics, and have been shorn of their terrors. The small-pox is made harmless by the curious process of passing the disease through one of our domestic animals. The plague has probably been banished by the general improvement in modes of living, though its cessation has been attributed to the introduction of the potato as an article of diet.

About forty years ago a new and strange pestilence made its appearance in Europe in the course of its desolating march from Asia, and it has since repeatedly filled the world with fear like that which of old accompanied the plague. But there now seems good reason to believe that epidemic cholera, like its two predecessors, has been conquered by the power of intelligence.

Among the many substances that are produced when bituminous coal is subjected to destructive distillation at that temperature which is required for the manufacture of illuminating gas, is a compound which has acquired the name of carbolic gas, though, as its properties are those of an alcohol and not those of an acid, a more appropriate name would be carbolic alcohol. It is this substance which seems to have given man control over the last and most terrible of the pestilences that have desolated the world.

The New York Board of Health, in one of their reports in 1865, made the statement that pestilences among men have generally been preceded by epidemics in cattle, and they regarded the prevalence of pleuro-pneumonia as one reason for apprehending a visitation of cholera. Besides their advent as harbinger and follower, there are other intimate relations between these two epidemics.

In 1849 it was announced that a microscopist in Michigan had discovered minute animalculæ in the fæces of cholera patients, but this discovery being American, had to wait, like anæsthesia, the Ruhmkorff coil, and so many other American discoveries, till it could be rediscovered or appropriated by some European pretender. When an Englishman, Mr. Beale, found similar animalculæ in the blood of cattle suffering with pleuro-pneumonia, the most eminent masters of science proclaimed the important discovery.

In the case of pleuro-pneumonia, Mr. Crookes passed the breath of diseased cattle through tufts of cotton wool, and produced the disease in healthy cattle by inoculating them with the matter thus collected. In a recent lecture, Dr. F. Crace Calvert declared his agreement with Mr. Crookes in the inference that the breath of the diseased cattle must have transferred to the cotton wool the germs of the animalculæ which Mr. Beale found in the blood.

As the presence of carbolic acid even in the form of vapor, and in extremely minute quantities, is death to all organic germs, it was inferred that by its use the propagation of pleuro-pneumonia from diseased to healthy cattle might be effectually prevented. The brilliant success of Mr. Crookes in the practical application of this theory, as set forth in the report of the Royal Commission, has already been published in our columns. Dr. Calvert, in the lecture above referred to, says that the spread of pleuro-pneumonia was arrested in Belgium and Holland, as well as in England, by the use of carbolic acid. There is no room left to doubt that pleuro-pneumonia in cattle can be controlled by carbolic acid: will this substance also stop the spread of cholera?

During the summer and fall of 1866 the cholera several times secured a foothold in this city, and every time it was stamped out by the Board of Health. Dr. Harris and other members of the Board regard carbolic acid as the most efficient agent which they employed. It was also used with similar success in several other of our principal cities. Dr. Calvert refers to numerous cases in England where the spread of the cholera was absolutely stopped by the same agent.

Whatever may be the theory of the disease, the numerous and rapidly multiplying facts give us at least a reasonable hope that the means have been discovered for stopping effectually the spread of Asiatic cholera, and that terrible pestilence will scourge the earth no more. If this should prove to be the case, the discovery must take rank as by far the most valuable and beneficent of any one that has been made in the nineteenth century—a century so prolific in great discoveries.

PLASTER MOLDS FOR THE CASTING OF LOW FUSIBLE METALS.

Plaster of Paris is one of the most useful substances employed in the arts. Its generic name is gypsum, and it is largely used as a fertiliser, the mineral being coarsely ground in a mill and scattered broadcast over the land, or plowed in. Its constituents are sulphuric acid, 46.8; Lime, 32.9; water, 20.8, the nitric acid and lime combined being its fertilizing properties. It is known under various specific terms: as gypsum, alabaster, marble, etc., owing to the varying proportions of its constituents. It is the substance which ornaments subterranean caves with brilliant stalactites and stalagmites, and is known in the arts frequently by the name of crystal. French clocks, so popular as parlor ornaments, have their supports and frames composed of selected specimens of this widely diffused mineral, some of which are almost transparent and most of which are translucent.

The use, however, of the substance as a fertilizer and as an ornamental material in the fine arts is, in its application, less extensive than in mechanical processes. Our dentists would find much difficulty in the progress of their business if plaster of Paris was rejected. In the taking of casts of the mouth, and of the living, as well the dead, for portraits and busts this substance is invaluable. It combines readily with water and dries rapidly, taking the minuest lines of the pattern and faithfully reproducing them. Combined with sand and lime it makes a durable, hard, and smooth cement used in Spain and France for floors and vaults.

In the use of plaster of Paris for metal molds our mechanics require some instruction. It is adapted to the casting of the low fusible metals, if the mold after being once made is properly prepared. To prepare these molds they should first be submitted to the action of the atmosphere for several hours, that the water mechanically combined with the plaster shall be driven off or evaporated; then, to expel the water chemically combined with the plaster, it is necessary that the mold should be exposed to a heat of at least 400° F., for about four hours to make it fit to receive the metal without cracking and ruining the casting. By the following table it will be seen what is the fusible point of various metals and their combinations. We quote from a table arranged by Prof. P. H. Vander Weyde, all the compositions of which we believe can be cast successfully in plaster molds.

Boiling water is 212° F. But some metals or compositions of metals melt or fuse at a still lower heat. For instance, a composition of 5 parts bismuth, 3 of tin, 3 of lead, and 1 of mercury fuses at 167° F.; 4 parts bismuth, 1 of lead, and ½ mercury melts at 185° F.; 4 of bismuth, 1 tin, 1 lead, at 203° F.; 5 bismuth, 4 tin, 1 lead, 257° F.; 1 bismuth, 1 tin, 284° F.; 3 tin, 2 lead, 329° F.; 3 tin, 1 lead, 338° F.; Tin, pure, 428° F.; Bismuth 500° F.; Lead 617° F.

All these compositions and others may be cast successfully in molds of plaster of Paris. The condition is that the cast or mold should be allowed to dry thoroughly in the atmosphere or rather in a warm room and then be exposed to a heat of at least 400° for several hours. If the mold becomes red hot so that it is nearly transparent it will not receive injury if properly treated. Such molds should be allowed to cool gradually, when, if they have been properly managed it will be found they will give sharp and clean impressions of the metals they receive.

THE DETROIT DILEMMA.

We are indebted to Stanley G. Wight, Esq., one of the commissioners, for the sixteenth annual report of the Detroit Board of Water Commissioners for the year 1867. There is the usual amount of statistical information of merely local value, but one feature of the report is of general interest. We refer to the efforts of the commissioners in devising some way of preventing the ice from choking up the main inlet pipe. This pipe extends 150 feet into the river, and terminates in a bell-shaped mouth elbow, three feet in diameter, turned upward, in water twenty-five feet deep. Covering the end of the pipe is a boiler-plate strainer, perforated with half-inch holes, 144 to the square foot. Inside the shell of the strainer is a diaphragm plate with similar holes, and below this the strainer shell has four-inch holes, to allow the sand to pass through, so as not to bank upon the outside of the strainer. When the engine is pumping, the water is required to pass through the strainer holes at the rate of 120 barrels per minute. This is the full supply, but in extreme cold weather, under certain circumstances, it is with great difficulty any water can be obtained, in consequence of the accumulation of ice. The circumstances under which the difficulty occurs are, when the weather is cold and ice is forming in the lake above, and on the shores of the river, and the river is free from ice over the strainer. But when the river is covered with ice over the strainer, the difficulty does not occur at any degree of cold. The great difficulty occurs when the thermometer ranges from 7° or 8° to 18° or 20° above zero; but when the mercury rises above 20° the difficulty soon ceases. The greatest number of detentions, it has been observed, occurs at night, and when the sun is obscured by clouds, but when the sun is unclouded, no difficulty is ever experienced.

With the rapidly increasing consumption of water, the commissioners foresaw that the time would very soon arrive when it would not be safe to permit any detention to the pumping engines, and that this remarkable phenomenon must be solved and the difficulty overcome. The committee have adopted every accessible means of investigation to obtain suggestions and information on this subject. Attention has been called to it in published reports, and by the press. Men of science have been seen and corresponded with, and scientific associations have been requested to investigate the subject, but as yet no complete remedy has been discovered. As no experiments had ever been previously made, and the theory was so strongly presented that the trouble was wholly from anchor ice forming on the strainer, an opening was cut through the down-stream side of the strainer, and a self-acting door was hung, but this and the plan of suspending a line of booms so as to retain a covering of ice over it when the rest of the river was not covered, both failed to accomplish the object sought. The theory that the covering of the entire surface of the river by ice prevented radiation, and by that means the ice did not form on the strainer, was strongly urged; but, if so, any covering over the strainer would answer the same purpose. To test it, last summer submarine divers built a submerged platform of planks immediately over the strainer, but this proved of no avail, for the stoppages occurred at a higher temperature than before.

On the 29th of last December, when but a very limited supply of water could be obtained, divers went down, examined the strainer, and found that it and its surrounding piles, were one mass of ice particles collected into a mound some ten feet high and about fifteen feet in diameter, and that large quantities of minute crystals of ice were rapidly passing and adding to the mass already collected. Specimens of the ice were brought to the surface in a bag. It was in sheets and particles thin as paper, translucent, with sharp, pointed edges. A further examination developed the fact that the small amount of water the pump was then receiving came through the lower or down stream side of the strainer, this being the only point where the diver could approach it, and which was found but slightly covered with ice. Having ascertained the existing state of affairs, the commissioners felt confident that a remedy could now be provided, and with a large piece of canvas they had the strainer completely covered and encircled, except on the down-stream side, but temporary relief only was afforded by this expedient, and another descent to the strainer was undertaken. The diver went down and found out this very important fact, that with the temperature of the atmosphere at 29°, the water at the surface was 33°, while at the bottom of the river it was 35°. At this descent much less ice was found on the strainer and its surroundings than at the first time. The lower side was clear, but on the upper side the action of the current had worn the ice into elongated cones, pointing up stream. At this time the pump was receiving a full supply of water. About three hours later, the diver again descended (thermometer 33°); he found the ice had entirely disappeared. The wooden platform was removed, since which time no trouble was experienced, until the surface ice of the river began to move, when there was a few hours during which no water could be obtained, but with this exception no further delays have since occurred.

It is clearly proved that ice particles are ever present in the river, and are continually passing down by the action of the current, collecting upon whatever obstructions they happen to meet with in their passage. The commissioners, therefore, advise the entire removal of all spiles and other substances adjacent to the strainer, believing that with nothing but the smooth dome of the strainer for these particles to lodge upon, the quantity that will accumulate cannot very seriously prevent the flow of water to the inlet pipe.

RELIEF TO MANUFACTURERS.

Probably no measure proposed in the present Congress is of more importance to the manufacturing and mechanical interests of the country, and to the country at large, than the bill reported by Mr. Schenck from the Commitee of Ways and Means and passed by the House of Representatives by a vote of one hundred and twenty-two, to two. It will also undoubtedly receive the sanction of the Senate and the President, when it will become a law, to take effect on the first of next May. Its most valuable provision is the total repeal of section 95 of the internal revenue law, which taxed and re-taxed manufactured articles at almost every step of their progress of manufacture. It repeals all revenue tax on manufactures of every description except on the manufacture of gas, petroleum, lubricating and illuminating oils, liquors, tobacco, and snuff.

When this bill, becomes a law, it will give an impetus to business which the country greatly needs, and remove a load grievous to be borne, from the shoulders of our industrial classes.

Rumford Chemical Works.

In the list of patents for the week ending March 11th, we notice an unusual number granted to Messrs. Horsford & Wilson, President and Treasurer of the Rumford Chemical Works, Providence, R. I., upon improvements relating to the manufacture of phosphoric acid. This article, which is the basis of the self-raising flour so largely manufactured by

Messrs. Hecker and others throughout the country, is the acid constituent of Horsford's self-raising bread preparation and of the Rumford Yeast Powders, which have come into such extensive use. In these preparations the properties usually lost with the bran in bolting, are restored to the flour, greatly increasing its nutritive value.

Artificial Wine.

John. F. Siebenmann, Milwaukee, Wis., has obtained a patent for the following queer mixture: Water, fifty gallons; raise the temperature of the room to 86° or 90° Fah., after which add the following ingredients:

	For ordinary quality.	For best quality.
White sugar	95 pounds.	150 pounds.
Pure tartaric acid	3 "	2½ "
Tamarind	6 "	6 "
Raisins	6 "	12 "

The raisins should be severed from the stems, and cut or crushed. Boiling water should then be added until the temperature of the mass is raised from 81° to 90°. The mass should then be well mixed to dissolve the sugar and acid. When dissolved, add six pints of good beer yeast, for the ordinary quality, or eight and a quarter for the best quality, and mix thoroughly. If wine yeast can be procured, as it can be after it is once formed, it may be used instead, but double in quantity.

Care should be taken that the temperature does not rise above 90°, nor fall below 81°—86° being suited for the purpose. In about twelve hours the mass will be in fermentation, and at first it should be stirred up about once in twelve hours, but afterward once in twenty-four hours, until fermentation ceases, which will occur in from ten to fourteen days. When the fermentation is over, the wine is placed in casks and put into the cellar, where it still ferments for three or four weeks, after which it is ready to be drawn from the casks and purified. In order to give to the wine, especially the best quality, its "bouquet," the following ingredients are added to the mass in the tub, before the yeast is added: Fresh-dried elder flowers, 1 oz; crushed nutmegs, ½ oz.; cut mace, ½ oz; Florentine iris root, ½ oz.; and one pod of vanilla, also cut. The color is imparted by the application of the sugar color, a process well known to those skilled in the art, after the second fermentation is completed and the wine is drawn off. In order to make red wine, fruits or berries are used which give a red color, such as cherries, whortleberries, elderberries blackberries, etc. These are crushed and added to the mass when fermentation commences.

The Hugon Gas Engine.

The advantage of this over other gas engines consists in the dispensing of electricity, with its accompanying complicated arrangement of batteries and other encumbrances. By a simple arrangement the illuminating gas from the street mains, as soon as turned on, enters the cylinder mixed in its passage with about nine times its bulk of common air, forming a very explosive mixture. In starting the engine all that is necessary is to light two ordinary jets of gas, which in turn light two others, these last inflame the explosive mixture in the cylinder, and being extinguished by the explosion, are relit by the two jets fixed outside the cylinder. At the moment of explosion a very fine spray of water falling on the piston—the heat being then 1,200°—becomes steam, thus reducing the heat and equalizing the pressure throughout the stroke, so that the engine lubricates itself by its own action. It is entirely automatic in its working; no smoke; no supply of fuel need be kept on hand, and it neither requires skill to start it nor any attention during its action. A three-horse engine attracted great attention at the Paris Exposition.

Polishing Powder for Gold Articles.

Dr. W. Hofman has analyzed a polishing powder sold by gold workers in Germany, which always commands a very high price, and hence, it may be inferred, is well adapted for the purpose. He found it to be a very simple composition, being a mixture of about 70 per cent of sesquioxide of iron and 30 per cent of sal-ammoniac. To prepare it, protochloride of iron, prepared by dissolving iron in hydrochloric acid, is treated with liquid ammonia until a percipitate is no longer formed. The precipitate is collected on a filter, and without washing, is dried at such a temperature that the adhering sal-ammoniac shall not be volatilized. The protoxide of iron precipitate at first becomes charged with sesquioxide.

The Steam Man.

This automaton, which has furnished a number of paragraphs for the press, is on exhibition at 538 Broadway, New York city, nearly opposite the site of Barnum's Museum; but owing to some objection on the part of the owner of the hall, he is not permitted to "travel on his muscle," but is hung in slings and merely "marks time," as our military friends would say. We understand, however, that his managers have decided to test his powers more effectually, when we shall probably have more to say of him.

ELECTRICAL JEWELS.—One of the latest Parisian novelties is a scarf pin for gentlemen's wear in which a curious application of electricity is introduced. The pins are finished with imitation human heads the eyes of which are made to open or shut at the will of the owner. The electro-motor is a simple voltaic element of zinc and carbon, or zinc and platinum, the whole being inclosed in a small brass case conveniently carried in the vest pocket. The carbon is fixed in a vessel partly filled with a solution of sulphate of mercury, and the zinc is attached to the lid of the case. No electrical action is generated as long as the case is carried perpendicularly, but if laid on its side a current is formed.

OFFICIAL REPORT OF
PATENTS AND CLAIMS
Issued by the United States Patent Office,

FOR THE WEEK ENDING MARCH 10, 1868.

Reported Officially for the Scientific American.

PATENTS ARE GRANTED FOR SEVENTEEN YEARS, the following being a schedule of fees:—

On filing each Caveat.....$10
On filing each application for a Patent, except for a design.....$15
On issuing each original Patent.....$20
On appeal to Commissioner of Patents.....$20
On application for Reissue.....$30
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In addition to which there are some small revenue-stamp taxes. Residents of Canada and Nova Scotia pay $300 on application.

☞ *Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required, and much other information useful to Inventors, may be had gratis by addressing MUNN & CO., Publishers of the Scientific American, New York.*

75,234.—BOAT DETACHING BLOCK.—Nelson B. Adams, San Francisco, Cal.

I claim in combination with a block, the jaws, E E, with the long arms, F F, the short levers, H H, with shoulders, a a, forming a knee joint, the operating lever, J, having its fulcrum at G, and pivoted to the knee joints, I, the whole constructed, combined and operating as a detaching apparatus, substantially as and for the purposes herein described.

75,235.—LEAKAGE MEASURE, ALARM, AND INDICATOR.—Thomas P. Akers, New York city.

I claim, 1st, Providing for indicating the hight of leakage water in the hold of a vessel by means of weights of greater specific gravity than water, suspended from a pulley, so that one of the weights shall rise and descend with the rise and fall of the water, and the other make similar movements, but in a reverse manner, and by its movements communicate motion to registering, indicating, and alarm mechanism, substantially as described.

2d. The combination of a leakage measure which consists of two weights, and a chain, which is arranged to unwind from a pulley as fast as it winds upon the same, with an alarm, or with an indicator, or with a combined alarm and indicator, substantially as described.

3d. The combination of the wheels, L L', chain, F, weights, G G', pulley F, and disks, C C', substantially as and for the purpose described.

4th. The combination of a leakage measure, operating substantially as described, with the figured disks, the alarm devices, and gearing, L L and M, substantially in the manner and for the purpose described.

5th. The curved piece, h, constructed and applied to the hammer arm substantially in the manner and for the purpose described.

6th. The combination of the weight, G, cylinder, H, pendulum, K, and double-acting poppet valve, substantially as and for the purpose described.

7th. Arranging all the gearing, the alarm devices, the indicating disks, and the pulley of the weight chain or cord, upon a frame or spider of the case, A, substantially as described.

75,236.—FLOOR CLEANER.—Abraham Armstrong, Newburg, Ohio.

I claim in a floor cleaner, as described, adjusting the rubber and intervening plates by means of the set screws, for the purpose set forth.

75,237.—COLTER HOLDER.—Jefferson Aughe, Dayton, Ohio.

I claim the combination of the plates or disks, C, colter, B, beam, A, and bolt, e, substantially as described and for the purpose specified.

75,238.—APPARATUS FOR BURNING CRUDE PETROLEUM.—Henry Baldwin, Titusville, Pa.

I claim, 1st, The jacket, e, as arranged to surround the supply pipes and a portion of the heater, and used in combination with the same, substantially as and for the purposes set forth.

2d, The reflector, f, as arranged with relation to the heater, when used in conjunction with the same, substantially as and for the purposes set forth.

3d, The supplementary reflector, g, and blow pipe, h, as arranged with relation to the reflector, f, and heater, a, substantially as and for the purposes set forth.

75,239.—BOLT THREADING MACHINE.—Wm. B. Bement, Philadelphia, Pa.

I claim, 1st, For opening and closing the dies while the machine is in motion, two or more cranked or eccentric spindles, f, each carrying a toothed segment or pinion, adapted to internal teeth in a loose disk, which is controlled partly by a spring, d, and partly by the friction clamp herein described, or any equivalent to the same, the whole being combined with the spindle of a screwing machine substantially as specified.

2d, The cutting dies, I I, secured to the blocks, n n, but admitting of an adjustment independently of the latter, substantially as specified.

3d, The pump, with its piston and spring, in combination with the spindle, B, and its eccentric or cam, substantially as and for the purpose herein set forth.

4th, The within-described lever, spring pawl, and rack, arranged for operating the sliding head or plate, substantially as set forth.

75,240.—PROCESS OF PURIFYING IRON AND STEEL.—John F. Bennett, Pittsburg, Pa. Antedated Feb. 28, 1868.

I claim the use of carbonic acid gas, either alone or mixed with atmospheric air, or with other gases or vapors, when introduced into the body of molten iron or other metal, in combination with or immediately following the pneumatic process, for the purpose of removing sulphur, phosphorus, and any other impurities which will form chemical combinations with the oxygen of the carbonic acid, and deposit the carbon substantially as hereinbefore described.

75,241.—METRONOME.—Hiram S. Blunt, New York city.

I claim the adjustable rings or plates, A A' A'' A''', separated or united, in the form of a drum, with pins or stops, n n n n, secured to and forming a part of the movable shaft, C and B, in combination with the index or hand, d, and with or without the dial, D, for the purpose of indicating the number of beats in a bar of music, in the manner substantially as described and shown in the drawings.

75,242.—MODE OF PRESERVING EGGS.—Joseph Brakeley, Bordentown, N. Y.

I claim the preservation of eggs of hens or other fowls in the manner substantially as set forth above, that is to say, by drying them within their natural integument.

75,243.—BRICK CARRYING CAR.—John K. Caldwell, Pittsburg, Pa.

I claim, 1st, A series of tables, b, resting and turning on recesses in the supports, a, in a brick drying car, substantially as and for the purposes set forth.

2d, In a brick drying and bearing car, the supports, a, having ledges, c, inclines, c', and tenons, e, constructed and used substantially as and for the purposes set forth.

3d, The combination of the tables, b, supports, a, ledges, c, inclines, c', and tenons, e, in a brick drying car, when constructed and arranged as and for the purpose specified.

75,244.—LETTER BALANCE.—Benjamin Chambers, Jr., Washington, D. C.

I claim the knife edges in holes passing through the lugs, as herein described, and covered, the covering plate at one end being pivoted, whereby the knife edges are kept in place, and can be readily removed when it is required to remove them.

75,245.—PROCESS OF DEODORIZING AND REFINING SACCHARINE AND OTHER FLUIDS.—William Clough, Cincinnati, Ohio.

I claim the process of refining and deodorizing saccharine and other fluids herein specified.

75,246.—ROCKING CHAIR.—C. W. Conant, Gardner, Mass.

I claim the arrangement as well as the combination of the spring, D, and the arch piece, C, with the chair seat, A, the rockers, c c, and the supporting frame, B, thereof, the whole being to operate substantially as described.

75,247.—MOP PRESS.—L. S. Covey and John Duffy, St. Croix county, Wis.

We claim the box or receiver, E, constructed and operated substantially as described, in combination with the plunger, C, the lever, D, and the cross beam, F, and grooves, e e, all constructed and arranged substantially as and for the purpose described.

75,248.—GUN LOCK.—John F. Crabtree and Wm. N. Crabtree, Visalia, Cal.

We claim, 1st, The pawl piece, B, in combination with the trigger, E, and the lever, F, acted upon by the main spring, G.

2d, The spring catch, I, in combination with the lever, M, with the inclined oblong slot, O, for the purposes described and in a manner substantially as set forth.

75,249.—DEVICE FOR RAISING AND LOWERING WINDOW SASHES.—John D. Cramer, San Francisco, Cal.

I claim the combination and arrangement of the several parts of my device, namely, the recess, A, with the slotted plate, B, and the plate, D, connected to the staff, C, by the curved piece, c, substantially as described.

75,250.—HAME.—Benjamin Crawford, Allegheny City, Pa.

I claim, 1st, Making fastenings for connecting harness tugs or traces to hames, adjustable by an eye through the inner or forward end of each, such eye to be operated on a staple, d or d', in connection with proper locks or supports, e e', the same being attached to the hame or hames plate, for holding such fastenings at the proper point of adjustment, substantially as and for the purposes described.

2d, The shoulders, i i', constructed on the fastenings, f f', in combination with the supports, e e', for the purpose of relieving the strain which would otherwise come on the staples, d d', substantially in the manner above described.

75,251.—CLOTHES DRYER.—H. Du Bois, Marlborough, N. Y.

I claim, 1st, The combination in a folding clothes dryer, of the arms, B B, latches, a a, and springs, b b, with the central polygonal shaft, A, arranged and constructed substantially as and for the purposes herein described and set forth.

2d, The combination of the arms, C C, and legs, D D, with the shaft, A, arranged and constructed to fold up, substantially as herein described and set forth.

75,252.—MACHINE FOR DISTRIBUTING FERTILIZERS.—Jesse S. Edwards, Medford, N. J.

I claim the arrangement of the hopper, A, distributing shaft, G, wheels, C and D, and plows, B, as and for the purpose specified.

75,253.—MOP HEAD.—Richard W. English, Buffalo, N. Y.

I claim, 1st, The cross head, H, and shank, B, in combination with a screw ferrule, E, provided with a slot, R, as and for the purposes substantially described.

2d, The thumb nut, C, in combination with the parts, E E, and collar, D, substantially as and for the purposes described.

3d, The employment of the binding wire, for holding the collar, D, and parts, E E, together, as herein shown and set forth.

75,254.—BEDSTEAD FASTENING.—Bartholome Essig, Sacramento, Cal.

I claim the plate, C, for attaching the side rail of a bedstead to the post, having an arm, c, an oblique lug, b, so as to be firmly secured to the post by the tenon on the end rail, substantially as described.

And in combination with the plate, C, the plate D, fastened to the side rail, having a lug or key, g, fitting in to a slot or groove on the plate, C, substantially as and for the purposes described.

75,255.—HAY KNIFE.—Green Fenton, Streetsboro, Ohio.

I claim the handle, A, spring, C, pin, a, arm, c and blade B, all constructed and arranged in the manner as and for the purpose specified.

75,256.—LAMP BRACKET.—E. L. Ferguson (assignor to himself and Charles B. Clark), Buffalo, N. Y.

I claim, 1st, The combination of the two jointed arms, A' A", provided with suitable jaws for holding lamps of different sizes.

2d. The india-rubber ring, E, in combination with the said arms, arranged substantially in the manner set forth.

3d, The combination of the arms, A' A", ring, E, and cam, f, or equivalent, for distending the jaws of the clamp, substantially as set forth.

4th, The peculiar construction of the jaws, D D, provided with shoulder, m, flange, n, and contracted bottom, as shown and described, for holding lamps and fountains of different forms and sizes.

5th, The peculiarly formed casting, C, constructed and arranged with the plate, B, and bracket arm, A, so as to secure the latter in its socket, and also form a receptacle for matches, in the manner shown and described.

75,257.—HARNESS TRIMMING.—Milton A. Fisk (assignor to Edward M. Wesson), Springfield, Mass.

I claim as a new article of manufacture, a rosette or harness trimming, when constructed as herein described and for the purpose specified.

75,258.—PLATING SPOONS AND OTHER ARTICLES.—Marshall L. Forbes (assignor to the Meriden Britannia Co.), West Meriden, Conn.

I claim the mode, substantially as before set forth, of coating spoons and similar articles with a regulated unequal thickness of the plating metal by immersing different portions of the article for different periods in the bath of the electroplating apparatus with which the article is connected.

Also the combination of a holder, adapted to confine the article to be coated, with regulating mechanism to hold the articles partially immersed to the required extent in the depositing bath, substantially as before set forth.

Also the combination of a holder, adapted to confine articles, with mechanism for tilting the article, so as to vary the extent of immersion in the depositing bath, substantially as before set forth.

75,259.—MACHINERY FOR PRINTING YARN.—John Forrest (assignor to himself, John Archibald, and John Taylor), Lawrence, Mass.

I claim the combination as well as the arrangement of the two carriers for carrying skeins of yarn, in the manner described, with one or two series of printing wheels, composed of annular disks, their color rollers and cellular troughs, the whole being provided with mechanism to operate them substantially as and for the purpose specified.

Also the combination of the drying cylinder or apparatus, the two carriers as above, one or two series of printing wheels, their color rollers and cellular troughs, the whole being provided with mechanism to operate them, substantially as and for the purpose specified.

75,260.—KNITTING MACHINE.—Guy P. Fuller, Adrian, Mich.

I claim the combination of the finger, A, the disk or dial plate, B, the geared wheel, C, the pinion, D, or their equivalents, the frame E, the ratchet F, the lever, G, the friction wheel, H, the nut, I, the shaft, J, the plate, K, when constructed substantially as described, for the purposes herein set forth.

75,261.—MILKING MACHINE.—B. F. Graves, Groton, Mass.

I claim the arrangement of the pump, with the flexible tubes, teat cups, glass tubes, stop cocks, devices for adjusting the teat cups to the udder of the cow, all constructed and arranged substantially as described and for the purposes specified.

75,262.—MODE OF ATTACHING ANIMALS TO CARRIAGES.—Henry B. Hale and Thomas Flagler, Grass Lake, Mich.

We claim the construction of a draft or extension bar, with or without joints, in connection with pulleys, straps, chains, and rods, arranged in the manner and for the purposes specified.

75,263.—HARVESTER RAKE.—Thos. Harding, Springfield, O.

I claim an automatic device which opens the switch, g, at each revolution of the rake and reel, and at the same time is under the control of the driver to make the raking only when it is necessary, in combination with a revolving reel and rake on a harvester, substantially as set forth and described.

The collar, O, provided with the clutch pin, n, and lug, o, in combination with the tripper, l, clutch lever, s, and switch, g, whereby the driver while on his seat may depress said collar and throw the clutch pin, n, out of connection with the head, L, to stop the rake from sweeping the grain from the platform, as desired.

Working the switch, g, automatically by means of the tripper lever, l, and a lug attached to a collar surrounding and revolved by the rake shaft, substantially as set forth.

Arranging the tripper, l, between the guide way and the rake-arm head upon the box or bearing of the rake shaft, substantially as set forth.

The combination and arrangement of the switch, g, provided with the arm l, and spring, k, with the tripper, l, and lug, o, or its equivalent.

75,264.—COMPOSITION FOR STUFFING LEATHER.—John Haseltine, Warren, N. H., assignor to himself and Person Noyes, Lowell, Mass.

I claim the combination of the herein-described ingredients in about the proportion specified, for the purpose and in the manner substantially as described.

75,265.—INVALID BEDSTEAD.—Wm. Heath, Bath, Me.

I claim the combination of the recesses, K K L L, or their equivalents, with the frame, A, the two frames, D E, and mechanism for moving and depressing or operating the back frame, E, substantially in manner described.

Also, the combination of the folding legs, M M, the toothed sectors, and their arms, f f, the frame, A, and the parts, B C D and E, arranged and connected substantially as specified.

75,266.—SHANK SPRING.—Ed. Heaton, New Haven, Conn.

I claim the construction of shank springs, when cut or stamped out of the sheet without scrap or waste, substantially as specified.

75,267.—COTTON-BALE TIE.—John W. Hedenberg, Chicago, Ill.

I claim a cotton-tie buckle, made and constructed substantially in the manner described.

75,268.—GANG PLOW.—Chas. Hess, Lyons City, Iowa.

I claim, 1st, The slot, T, in the head piece, and axle to adjust the tongue.

2d, The iron beams, when used in a gang plow.

3d, The combination and arrangement of the parts, when constructed and used as above set forth.

75,269.—STRAW CUTTER.—L. B. Hoit, Cedar Falls, Iowa.

I claim, 1st, The balance wheel, B, when provided with recessed and beveled arms, r r, and curved knives, K, attached thereto, in combination with the bevel gears, e f, the interchangeable feed rollers, C C D, and crank, g, as and for the purpose specified.

2d, The within-described arrangement of the intermediate spokes, r, of the balance wheel, with reference to the knife-carrying spokes, r, thereof, and the interchangeable feed rollers, C C, substantially as and for the purpose specified.

3d, The method, herein-described, of graduating the feed by the detachable or interchangeable rolls, C, of different sizes, arranged to operate underneath the yielding roll, D, and operated by the crank, g.

75,270.—CAR COUPLING.—Winfield H. Hoover, North Benton, Ohio.

I claim the combination of the pivoted drop, E, link, D, pin, C, and drawhead, B, when operated by the bar, F, with its side levers, H H, all constructed and used substantially as and for the purposes set forth.

75,271.—PREPARATION OF ACID PHOSPHATE OF LIME.—E.N. Horsford, Cambridge, Mass.

I claim, 1st, The method of producing a pulverulent acid phosphate of lime, substantially as and for the purposes above set forth.

2d, The product obtained by the process, substantially as and for the purposes above described.

75,272.—MANUFACTURE OF ACID PHOSPHATE TO BE USED IN FOOD.—E. N. Horsford, Cambridge, Mass.

I claim the manufacture of liquid acid phosphate of lime, for use as a condiment or article of diet, or ingredient to be employed in beverages or food, substantially as and for the purposes herein set forth.

75,273.—GRINDING MILL.—G. W. Hubbard and S. A. Smith, (assignors to Cresson & Smith), Philadelphia, Pa.

We claim, 1st, The lever, B, combined with and trued by the disk, a, substantially as described.

2d, The shell, D, with its inclined edge adapted to the plate, E, substantially as set forth.

3d, The spindle, A, with its burr, when confined in its place within the shell by two adjustable collars arranged upon the spindle, as specified.

75,274.—BABY CREEPER OR WALKER.—P. H. Hurd (assignor to Clara Hurd and E. D. Horton), Croton, Mich.

I claim, 1st, Frame, A, chair, B, and rollers, C, in combination, substantially as described.

2d, Revolving chair, B, with flexible seat, D, and strap, E, in combination with frame, A, substantially as and for the purpose described.

75,275.—CLOSING FRUIT JARS.—William M. Imlay, Philadelphia, Pa.

I claim, 1st, Making and adapting the neck of a fruit-jar so as to be used for a spiral wire coil, substantially as and for the purposes set forth.

2d, A wire coil, arranged and used about or around the neck of a fruit jar, so as to make a fastening for fruit jars, substantially as set forth.

3d, The arrangement and construction of a wire coil about the neck of a fruit jar, so as to make an elastic pressure on the cover, as described.

4th, The broad-seated ring or gasket, H, when retained in place by the beveled or inclined top, I, substantially as and for the purposes specified.

75,276.—GATE.—J. L. Janewa, Flemington, N. J.

I claim the continued arrangement of an ornamental or garden gate, B, with the stationary posts, A A, swivel bar, C, pivoted disks, r g, and caster rolls, m m, the whole constructed and operating as described for the purposes set forth.

75,277.—GRAIN DRIER.—J. B. Johnson, Indianapolis, Ind., assignor to himself, T. E. Johnson, and B. F. Johnson.

I claim, 1st, Making the top of the furnace of drying kilns of cobblestones

or boulders, or their equivalents, arranged substantially in the manner and for the purpose set forth.

2d. The deflecting plates, D, in combination with the furnace, constructed as described, substantially as and for the purpose set forth.

75,278.—ROCKER FOR CHILD'S CARRIAGE.—A. D. Juelson, Wooster, Ohio.

I claim the adjustable plate, C hooks, D, standard, E, and spring, F, as arranged, in combination with the rockers, A B, for the purpose and in the manner substantially as set forth.

75,279.—TUBE OF STEAM GENERATOR.—Peter M. Kafer, Trenton, N. J.

I claim, 1st, The continuous spiral guide, of uniform pitch, forming a continuous channel in vertical or inclined water tubes of steam boilers, substantially as set forth and described.

2d, The V-shaped piece, e, substantially as described and for the purpose set forth.

75,280.—LOCOMOTIVE ENGINE.—S. L. Langdon, New Orleans, La. Antedated Feb. 28, 1868.

I claim the arrangement of the cylinder of a street railroad locomotive engine on the under side of the cylindrical portion of the boiler by means of plates, J, or their equivalents, formed on the cylinder, one head of which is rigidly secured to the fire box, substantially as and for the purposes set forth.

75,281.—LAMP-WICK TUBE.—A. D. Laws, Bridgeport, Conn.

I claim a flat lamp burner tube, or lamp burner tube adapted to the use of flat wicks formed of a piece of sheet metal bent round and overlapped along the whole edge, substantially as herein shown and described.

75,282.—HORSE HAY FORK. — James E. Lobdell, Center Lisle, N. Y.

I claim, 1st, The sliding bar, B, with a knuckle head, f, and slots, e e, when used in combination with the main bar, A, and hooks or prongs, d d, substantially as set forth.

2d, The arrangement and combination of the main cutting bar and blade, A, slide bar, B, latch, c, and cutting hooks, d d, substantially as and for the purpose set forth.

75,283.—STEAM ENGINE.—J. L. Lowry, Pittsburgh, Pa. Antedated Feb. 20, 1868.

I claim an arrangement of the cylinders, valves, and passages for the steam by which I am enabled to use the steam alternately below and above the piston, substantially as herein described.

Also, in combination with the above-described arrangement, the reservoir for the reception of steam from the first and primary cylinder, substantially as herein described.

75,284.—PUMPING ENGINE.—J. L. Lowry, Pittsburgh, Pa. Antedated Feb. 24, 1868.

I claim the herein-described engine, when arranged as shown, and in combination with the pumps for raising water, substantially as shown and described.

75,285.—NASAL IRRIGATOR.—Morris Mattison, New York city.

I claim, 1st, The nasal plug, A, so shaped as to fit and close nostrils of different sizes, constructed sustantially as described.

2d, The combination of the nasal plug, A, constructed substantially as described, with the syringe, B C D, substantially as and for the purse set forth.

75,286.—CHURN DASHER.—Henry McDenough, N. Y. city.

I claim the dasher, b, constructed as specified, and mounted on the rod, c, to which a revolving movement is communicated by the spiral rib or groove as the parts are reciprocated, as and for the purposes set forth.

75,287.—BRICK MACHINE.—J. C. McKenzie, Adrian, Mich.

I claim, 1st, The springs, W, arranged and operating in combination with the bolts, X, and sliding hangers, X2, to afford an elastic support for the mold rack, substantially as and for the purpose described.

2d, The scraper, N, adjustable by means of slots, n, and set screws, m, employed in combination with the pivoted pinager, E, as and for purpose specified.

3d, Making some or all of the bars, L L', removable, by means of the buttons, l', or their equivalents, substantially as and for the purpose set forth.

4th, The segmental racks, J J, constructed substantially as represented and described, so as to admit of their reversal when worn.

75,288.—MACHINE FOR MARKING GROUND FOR PLANTING.—W. R. McKinley, Lucas county, Iowa.

I claim the frame, c c, wheels, a a a a, rods, f f f f, in all combined, constructed, and arranged as shown and described.

75,289.—PROCESS OF TREATING GOLD BULLION TO TOUGHEN and Refine it.—F. B. Miller, Sydney, New South Wales.

I claim the process of refining gold by applying chlorine to it while in a molten state, substantially as hereinbefore set forth.

75,290.—RACK FOR CARDING ENGINE.—L. Monroe, Lowell, assignor to himself and C. G. Sargent, Graniteville, Mass.

I claim, 1st, A series of slats or bars, g, constructed and operating substantially as described for the purpose set forth.

2d, The links, d, in combination with the pivoted slats or bars, g, as and for the purpose set forth.

3d, In combination with the two series of oscillating bars, the link or rod, D, for connecting one series of such slats or bars with the other series of similar bars, and for operating the same, substantially as and for the purpose specified.

4th, The eccentric, e, and slotted arm, c, or the equivalent thereof, combined with the series of pivoted slats or bars, and arranged to operate the same in the manner and for the purpose substantially as specified.

5th, The end connection, H, provided with a pivot, a, and stud, b, for connecting and operating the slats or bars, as set forth.

75,291.—STOVEPIPE CLEANER.—J. W. Mortimer, Peoria, Ill.

I claim a stovepipe cleaner having disk, A, arm, B, rod, C, and washer, D, constructed, combined, and operating substantially as and for the purposes herein specified.

75,292.—MANUFACTURE OF ELASTIC ROLLS.—Joel Moulton, Boston, Mass.

I claim, as an improved manufacture, the elastic roll or tubing, made substantially as herein shown and described, that is, as composed of india-rubber or other analogous gum, and a suitable webbing, with the fibers of the latter radiating from the center, or about the center, of the roll outward, as explained.

75,293.—PROCESS OF EXTRACTING THE PRECIOUS METALS from Ores.—Adolph Ott, New York city, assignor to Antonio Pelletier, Washington, D. C.

I claim, 1st, Roasting sulphurets, tailings, and residua from other treatments, either alone or mixed with chemicals, in the progressive and continuous manner herein described.

2d, In the roasting process of the ore or tailings, the use of chloride of iron, copper, or magnesium, and of hypochlorites of an alkaline, earthy, or metallic base, mixed with the ore or tailings, and employed as specified.

3d, The introduction of hyponitrous acid gas, or oxygen gas, obtained as set forth, in the roasting process.

4th, Precipitating precious metals from a solution of their soluble salts by means and with the use of the sulphuretted hydrogen gas produced in the process of roasting said ore, or by a solution of the same in water.

5th, The extraction of silver, or of silver and gold, from the roasted ore, by means and with the use of the double sulphite of an alkaline base ($KO\,2SO_2$ or $NaO,\,2SO_2$,) and of the hyposulphites of an earthy or metallic base, in the manner specified.

75,294.—APPARATUS FOR EXTRACTING PRECIOUS METALS.—Adolph Ott, New York city, assignor to Antonio Pelletier, Washington, D. C.

I claim, 1st, The ore-roasting furnace, A, composed of a series of ovens, C D E, with alternate flat and depressed hearths, in combination with the shaft, I, arms, L L', flues, P P' P'' P''', flues, M and N, and chambers, B and F, arranged and operating as set forth.

2d, In an oven for roasting ore, the flue, S, and tank, T.

3d, The combination of the flue, U, holes, V V V V, and ovens, C D E, with the pipe, x and y.

4th, The apparatus, B, composed of the apparatus, a, tank, b b b, and strainer, h, arranged together and operating as specified.

75,295.—PENSTOCK FOR UNDERGROUND DRAINS.—David A. Parks, Fairview, Ill.

I claim the combination of the stock, A A, partition, D, gate, E, and pipes, B B, arranged substantially as and for the purpose herein described.

75,296.—STEAM GENERATOR.—Patrick Quinn (assignor to himself and C. R. Paul), Newmarket, N. H.

I claim the combination and arrangement of the coiled pipe, o, deflector, q, jacket, g, and flues, k and l, the whole being arranged and operating together to produce the results before described.

75,297.—HARVESTER RAKE.—O. Redmond, Rochester, N. Y.

I claim producing the automatic movements of a sweep rake for harvesters by the employment of a crank, D, and a rock lever, E, jointed as described, the whole operating in the manner and for the purpose herein set forth.

75,298.—SCROLL FOR WATER WHEEL.—Timothy Rose, Cortlandville, N. Y.

I claim, 1st, Making the curb, D, between the guides, b, and openings, a, concentric with and inclosing the wheel so as to form a closed case to the buckets of the wheel between each guide and opening, in the manner herein described.

2d, The hinged gate, F, the concentric curb, D, with its issues, a, and projecting guides, b, when arranged and combined as described.

3d, The gate, F, hinged within the scroll, for the purpose of shortening or diminishing the length of the same, to adapt it to the supply of water.

75,299.—YOKE FOR HORSES.—E. Sanford, Meriden, Conn.

I claim, 1st, The peculiar construction of the ordinary hames, such as are used in draft-harness for horses, so as to dispense with traces and connect them for draft with a beam or yoke passing under the horses' necks, by lengthening and extending downward through mortises in the ends of said yoke, and fastened by pin on the under side, as shown in the drawings.

2d, The slide plate, D, secured to the under part of the beam, by which means the hames may be adjusted to the necks of the horses, and them firmly secured in position by the set screw, as shown in the drawings.

75,300.—FURNACE.—Gottlieb Schreyer, Columbus, Ohio.

I claim, 1st, The contracted throat, b, which is formed by two independent streams of air escape, and meet or cross one another in said throat, substantially as and for the purpose described.

2d, The construction and relative arrangement of the independent air-receiving air conduits, a G, and escape aperture, b, in the fire chamber, in the manner and for the purposes described.

75,301.—STEAM AND WATER PACKING.—William C. Selden, Brooklyn, N. Y.

I claim, 1st, A packing for steam engines, pumps, etc., made substantially as described, by combining cloth or fibrous material with paper, or with compounds in which paper is an element.

2d, Combining vulcanized india-rubber, or other equivalent elastic substance, with paper packing in any of its various forms, or with compounds for packing purposes in which paper is an element, in the manner substantially as described, to secure the results specified.

3d, Saturating packing with tallow to accomplish the purpose specified.

75,302.—METAL TOP FOR LAMP CHIMNEY.—F. I. Seymour, Wolcottville, Conn.

Claim, 1st, Connecting the lapped edges of the sheet metal cap, near the upper or smaller end, by means of a rivet, or its equivalent, for the purposes and substantially as set forth.

2d, An expansive ring, introduced in the head formed near the base of the sheet-metal cone, for the purposes and substantially as set forth.

75,303.—CLAMP FOR FORMING SHEET-METAL CONES.—F. I. Seymour, Wolcottville, Conn.

I claim, 1st, The clamp for sheet-metal cones, formed of the cones, a and c, locked together, as and for the purposes set forth.

2d, And, in combination therewith, the sleeve, e, surrounding the cone, c, substantially as and for the purposes set forth.

75,304.—DIFFERENTIAL GEAR POWER MACHINE.—Henry Franklin Shaw, West Roxbury, Mass.

I claim the two pulleys or winding barrels in the differential gear-power machine, connected by gear as described, eccentrically hung upon a free revolving actuating shaft, operating substantially as described and for the purpose set forth.

75,305.—LOOM.—James Shaw, Ballardvale, Mass.

I claim the combination of the short shaft, C, pinion, D, shaft, E, pinion, H, shaft, F, pinion, G, tappets, k k, roller arm, l, vertical shaft, g, spring, i, and lever, e, all constructed and arranged with the loom frame, as and for the purpose set forth.

75,306.—SEAT FOR HARVESTER.—Edward A. Smith, St. Albans, Vt., assignor to himself and John W. Newton.

I claim the seat for mowers or reapers, formed with sockets on the under side of the seat, receiving helical or spiral springs, in combination with the sockets on the crown piece or seat supporter, and with the connecting link, i, substantially as and for the purposes set forth.

75,307.—FLOUR BOLT.—Scott A Smith (assignor to Cresson & Smith), Philadelphia, Pa.

I claim, 1st, The bolt, unsupported, excepting at its opposite ends, and having a belt arranged for being struck by recoiling springs, or other equivalent devices, all substantially as and for the purpose herein set forth.

2d, In combination with the above, a spring or springs secured to the bolt, or to the box containing the same, and operated substantially in the manner herein set forth and for the purpose specified.

75,308.—APPARATUS FOR CHARGING GAS RETORTS.—James F. Snediker and William F. Bailey, Bristol, Pa.

We claim, 1st, The truck, A, and its swivel bearings, d, in combination with a series of scoops, C, the handles of which rest on and slide in the said bearings, substantially as and for the purpose described.

2d, A sliding bottom, F, in combination with a scoop, C, substantially as and for the purpose specified.

3d, A scoop, consisting of adjustable side pieces, m m, and bottom pieces, o o', constructed, arranged, and connected to the handle, i, substantially as and for the purpose set forth.

4th, The wheels, t, in combination with a scoop, C, for the purpose described.

75,309.—PAVEMENT.—Charles W. Stafford, Saybrook, Conn.

I claim, 1st, The arrangement of the oblong blocks, decreasing in depth from the center to the sides, so as to form a camber in the street, while resting on a level metallic base, C.

2d, In combination with the base of a sectional pavement, the spanner, G, and screw, H, operating as described.

3d, The combination and arrangement of the flanges, n n, link, p, and keys, o o, substantially as and for the purpose described.

75,310.—STEAM PLOW AND CULTIVATOR.—Philander H. Standish, Martinez, Cal., assignor to himself and Oliver C. Coffin.

I claim, 1st, A steam plow, having the rotary knives, I I, operating in a horizontal plane and transversely to the travel of the machine, and the supporting arms, k k, or their equivalents, together with the vertical shafts, b, the whole constructed and operating substantially as herein described.

2d, The movable frame, C, and the arms, a a, together with the chains, V, and capstans, W, for raising and depressing the plows, substantially as herein described.

3d, Operating the plows, when moving in a horizontal plane, directly from the engine by the belt, b, or an equivalent device, substantially as described.

75,311.—WASHSTAND.—A. Stankowitch, Philadelphia, Pa.

I claim a water reservoir, H, secured to the lid of a washstand, and so arranged as to be received by the basin, G, when the lid is closed, all substantially as described.

75,312.—SOLDER FOR ALUMINUM.—Alfred Starr, N. Y. city.

I claim the compound or alloy specified, as a solder for aluminum.

75,313.—FLUID METER.—Charles Stein, Philadelphia, Pa.

I claim the combination, substantially as described, of a revolving or oscillating magnet and the registering bar, J, or its equivalent, with a fluid meter, for the purpose specified.

75,314.—MODE OF SECURING THE ENDS OF FELLIES AND SPOKES IN CARRIAGE WHEELS.—John Switzer, Lynn, Mass.

I claim the improved mode of fastening the ends of the fellies and the spokes in carriage wheels, by means of the metallic block, E, constructed and applied and secured by the bolts, d d, as explained.

75,315.—DEVICE FOR PREVENTING WATER PIPES FROM BURSTING.—R. H. Smith Thompson, Georgetown, D. C.

I claim the arrangement at the joints of water pipes of two concentric cylinders, the interior cylinder to be of elastic material, and thus form an air cushion, and to operate substantially as described.

75,316.—FOLDED FAN.—T. S. Thorn, South Amboy, N. J.

I claim, 1st, The combination, with the ribs, B C and C', and handle, D, of the ferrule, G, substantially as and for the purpose set forth.

2d, The combination, with the ribs, C and C', of the clasp, F, ferrule, G, and handle, D, substantially as and for the purpose set forth.

75,317.—LAMP EXTINGUISHER.—Edwin J. Toof, Fort Madison, Iowa.

I claim, 1st, So combining a hinged cone, D, extinguisher or cap, B, and a connecting arm, C, or its equivalent, that the opening of the cone will remove the extinguisher from the wick tube, substantially as herein specified and set forth.

2d, In combination with said extinguisher, cone, and connecting arm, the arrangement of a suitable support, E, to retain the extinguisher away from the wick tube when the cone is closed, substantially as herein specified and described.

3d, The combination of a finger, d, operating through a slot in the external case of the burner, in combination with the arm, E, connecting arm, C, extinguisher, B, and cone, D, substantially in the manner and for the purposes set forth.

4th, In combination with the cone, D, hinged as described, and the arm, E, arranged in connection therewith, substantially as described, a stop or rest, F, upon the case of the burner, arranged so as to sustain the cone in place, and prevent its swinging over upon its hinge, substantially in the manner described.

5th, In combination with the extinguisher, B, cone, D, connecting arm, C, arm, E, provided with a suitable rest and a lever, a, the shaft, H, and arm, J, arranged to operate substantially in the manner herein set forth.

75,318.—WICK REGULATOR.—Edwin J. Toof, Fort Madison, Iowa.

I claim, 1st, In combination with a wick tube, provided with vertical slots, a' a', the arrangement of a slide, b, upon the outside of the tube, provided with points, b' b', projecting into said tube through said slots, so as to operate in the manner and for the purposes described.

2d, The combination of the slotted wick tube, a, the slide, b, provided with points, b' b', and the shaft, d', or its equivalent, arranged and operating substantially as and for the purposes set forth.

3d, The arrangement of a spring, n, in combination with the above, operating as and for the purposes set forth.

4th, The combination of the tube, a, slide, b, shaft, d', and springs, with the chimney clamp, D E F, as and for the purposes specified.

75,319.—COTTON BALE TIE.—William Trowbridge, New Orleans, La.

I claim the device herein described, to wit, a section or piece of wire, so formed as to be provided with the loop or eye, C, and the hooks, B and B', as herein described for the purpose set forth.

75,320.—MACHINE FOR MAKING BUTT HINGES.—William H. Van Giesen, Passaic N. J., and John J. Crooke, New York city.

We claim, 1st, The combination of transferring fingers, with dies, e' e', when said fingers and dies are operated by mechanism substantially as and for the purpose set forth.

2d, The combination of the levers, y2, cam, a', and fingers, l, with the slides, b' b', the whole being arranged substantially as and for the purpose hereinabove specified.

75,321.—BED BOTTOM.—Henry B. Walbridge, Toledo Ohio.

I claim, 1st, A bed bottom, which is composed of a hinged sectional frame, B B', having the sacking secured permanently to one section, and applied to the other section by means of a flat bar, c, and clamps, f g, substantially as described.

2d, Constructing the sacking frame, B B', and applying the sacking thereto, in such manner that, while the sacking can be more or less slackened or tightened at pleasure, one section of said frame will serve as a means for forcibly tightening the sacking, in combination with retaining cleats and removable pins applied in the boosted rails, substantially as described.

75,322.—ADDING MACHINE.—C. H. Webb, New York city.

I claim, 1st, The duplicate series of numbers, arranged upon the margin of the numerator wheel, B, substantially as and for the purpose specified.

2d, In combination with the above, the semi-circular slot, L, in the dial plate, J, corresponding in extent with one of the duplicate series of numbers, for the purpose substantially as described.

3d, Arranging, on the dial plate, J, a series of numbers corresponding in extent with one of the series of numbers upon the numerator wheel, B, substantially as described and for the purposes specified.

4th, The prefix of a cypher, upon the numerator wheel, B, to the digital numbers from zero (0) to nine (9) inclusive, for the purpose specified.

5th, In combination with the numerator wheel, B, the revolving multiplying wheel, when arranged in opposition to the numerator wheel, and having its edge in contact, or nearly in contact, therewith.

6th, In combination with the elements of the above, the slot K, in the dial plate, J, for the purpose specified.

7th, The arrangement of the numerator wheel, B, lever, G, and multiplying wheel, E, all constructed substantially as described and for the purposes specified.

8th, In combination with the arrangement above specified, the slotted dial plate, J, when constructed substantially as and for the purposes specified.

75,323.—SELF-OILING HUB FOR PULLEY, ETC.—David M. Weston, Boston, Mass.

I claim, 1st, A loose wheel or pulley, having its hub provided with the chamber, D, and opening, E, with the partition, a, or its equivalent, when constructed and arranged to operate substantially as described.

2d, In combination with the chamber, D, the dove-tailed recess, l, with the passages, e, leading into said chamber, substantially as and for the purpose set forth.

75,324.—GATE AND DOOR SPRING.—Benjamin F. Whitaker, Whitestown, Ind.

I claim the application of the circular rod, and also the coil of wire used as a circular spring, as set forth in the drawing.

75,325.—MANUFACTURE OF PHOSPHATIC FERTILIZER.—George F. Wilson, East Providence, R. I.

I claim, 1st, The method of decomposing the said bone phosphates by the said salt cakes, substantially as above described.

2d, The fertilizing product, produced substantially as above described.

3d, The revolving cylinder, substantially as above described, when used in connection with the manufacture of either nitric, muriatic, or sulphuric acid, or two or more of them, for the purpose of producing the aforesaid fertilizer or compound, substantially as above described.

4th, The manufacture of the aforesaid fertilizer in connection with either, any, or all of the aforesaid acids, by the use of the resulting residuary salt cake or cakes, substantially as and for the purpose above described.

75,326.—PREPARATION OF BONES FOR THE MANUFACTURE OF PHOSPHORIC ACID AND PHOSPHATES.—George F. Wilson, East Providence, R. I.

I claim, 1st, My new and improved process of burning and roasting bones gray, substantially as and for the purposes hereinbefore described, as preliminary to the extraction therefrom of acid phosphate of lime.

2d, As an improvement in the process of preparing acid phosphate of lime, the use of bone coal treated substantially as hereinbefore described.

3d, The improved furnace, constructed and operating substantially as and for the purposes as hereinbefore described.

75,327.—MANUFACTURE OF PHOSPHATES FOR AGRICULTURAL PURPOSES.—George F. Wilson, East Providence, R. I.

I claim the process of reducing bones with acid, substantially as above described, whereby I have made the manufacture of a fertilizer under the name of superphosphate of lime, more economical and more valuable than any other process heretofore known.

75,328.—MANUFACTURE OF ACID PHOSPHATES.—George F. Wilson, East Providence, R. I.

I claim, 1st, The improved process hereinbefore described, of mixing farinaceous matter with acid phosphate of lime, in the manner and for the purpose above described.

2d, The improved grinding or disintegrating apparatus, constructed and operating substantially in the manner and for the purposes as above described.

3d, The application of granite rollers in the manner and for the purpose above described.

4th, The combination of the grinding rollers and their connections with the self-adjusting pressure lever, substantially as and for the purposes described.

75,329.—PREPARING BONES FOR THE MANUFACTURE OF ACID PHOSPHATES.—George F. Wilson, East Providence, R. I.

I claim, 1st, The new and improved method or process of destructive distillation of bones, whereby the products of distillation are principally condensed, the ammoniacal products thereof preserved, and the remaining gases conveyed to the furnace, thereby adding heat to the flame and destroying the offensive odors, substantially as above described.

2d, A new and improved means or method of destructive distillation of bones by the use of horizontal retorts, in connection with the coolers above described, whereby the retorts of the furnace may be continuously used without losing their heat, while at the same time the burned or distilled bone is being cooled and excluded from the air in said coolers.

3d, The combination of the retorts, A, the reservoir, E, the condenser, B, and the chamber, D, with its mechanical agitator, or its equivalent, and the connecting pipes above described, substantially as and for the purpose hereinbefore set forth.

4th, The combination of the retorts, A, the reservoir, E, the condenser, B, and the connecting pipe, g2 g1, for the purpose above described.

75,330.—DRYING ACID PHOSPHATES.—Geo. F. Wilson, East Providence, R. I.

I claim, 1st, My improved process of drying the granulated acid phosphate of lime by exposing the same to continuous currents of heated air on both sides of the columns thereof, substantially as and for the purposes described.

2d, The application of the improved apparatus, constructed and operated substantially as described for the purpose aforesaid.

3d, The arrangement of the revolving troughs, or their equivalent, combined with the vertical lattice sides, substantially as above described, by which the process of drying is rendered uniform and continuous.

75,331.—PROCESS AND APPARATUS FOR THE MANUFACTURE OF ACID PHOSPHATE.—Geo. F. Wilson, East Providence, R. I.

I claim the improved mechanism for sifting the mixture of coarsely and finely powdered acid phosphate of lime, as described under Horsford's patents, and separating the coarser parts of the same, substantially as and for the purpose described.

75,332.—BURNING BONES FOR THE MANUFACTURE OF ACID PHOSPHATES.—Geo. F. Wilson, East Providence, R. I.

I claim, 1st, The new and improved furnace, substantially as above described, whereby the flame is carried under the hearth thereof, and is introduced into the chamber which contains the bones, where it burns with the combustible products of distillation and atmospheric air, admitted in regulated quantities, and thus, while the offensive odors are destroyed, the heat of the chamber is intensified to the degree required for the production of white burned bone, without converting the same into an insoluble pyrophosphate of lime, the flame and products of combustion then passing into the flues over the chamber into the escape flues.

3d, The new and improved process of burning bones white, whereby I am enabled to obtain from them a pure phosphate of lime, in the manner and for the purpose above specified.

75,333.—GRINDING AND PULVERIZING ACID PHOSPHATES.—Geo. F. Wilson, East Providence, R. I.

I claim, 1st, An improved process of disintegrating and pulvering the dried and granulated mixture of acid phosphate of lime and farinaceous matters, substantially in the manner and for the purposes described, whereby the heating thereof is prevented, by causing the pulverizing action of the mill to be applied to any particular portion of the mixture to be at intervals, which allow time for cooling between successive impacts.

2d, The application of the above described apparatus to the pulverization of acid phosphate of lime mixed with farinaceous matters, substantially as above described.

75,334.—GRANULATING ACID PHOSPHATES.—Geo. F. Wilson, East Providence, R. I.

I claim, 1st, The process of dividing the lumps of mixed acid phosphate of lime and farinaceous matter into small lumps, substantially as and for the purpose specified.

2d, The combination of the feeding spout and vibrating sieve or grater, constructed and operated substantially as above described and for the purpose above set forth.

75,335.—APPARATUS FOR CONVEYING ACID PHOSPHATES AND OTHER ACID LIQUIDS.—Geo. F. Wilson, East Providence, R. I.

I claim, 1st, My improved pump, constructed of lead and vulcanized rubber, or gutta percha, substantially as and for the purpose above specified.

2d, The application of vulcanized rubber or gutta percha hose, in combination with the above described pump, for the transfer of acid phosphate of lime liquor, for the purpose above set forth.

75,336.—MANUFACTURE OF PHOSPHATE AND EXTRACTING PHOSPHORIC ACID FROM BONES.—Geo. F. Wilson, Providence, R. I., and Eben Norton Horsford, Cambridge, Mass.

We claim, 1st, The new and improved process of extracting acid phosphate of lime from bones, as hereinbefore stated.

2d, The continuous agitation of the mixture of sulphuric acid, acid phosphate of lime and pulverized gray bones, by which the action of the sulphuric acid is rendered uniform, and the sulphate of lime, produced in the decomposition of the gray bone, is prevented from setting or hardening in lumps, or in mass, which would interfere with leaching, as well as with the perfect decomposition of the gray bones.

3d, The distribution of the mass to be leached in broad, shallow pans, in the manner and for the purpose above described.

4th, The use of vessels made of lead, or lined with lead, for the purpose above described.

5th, The application of the tamping operation, or its equivalent, to the mixed acid phosphate of lime, carbon, and sulphate of lime, to keep them as nearly as possible of uniform thickness and consistency upon the leach cloth, in order to the more uniform and perfect leaching thereof.

6th, The treatment of the burned bones above described with sulphuric acid, diluted to or beyond the point of precipitating the sulphate of lead present therein, this dilution being made with a weak solution of acid phosphate of lime.

7th, The apparatus above and substantially as described, as a whole, for the purpose of obtaining liquid acid phosphate of lime, substantially as above described.

75,337.—TREATING THE MIXTURE OF ACID PHOSPHATE OF LIME AND FARINACEOUS MATTERS IN ORDER TO GRANULATE THEM.—Geo. F. Wilson, East Providence, R. I., and Eben Norton Horsford, Cambridge, Mass.

We claim the new and improved process of treating acid phosphate of lime when mixed with farinaceous matter, for the purpose of so drying and ageing the same as to prepare it for the successful application of mechanism for granulation, in the manner substantially as and for the purpose above described.

75,338.—PROCESS OF TREATING ACID PHOSPHATES IN THE MANUFACTURE OF YEAST POWDERS, ETC.—Geo. F. Wilson, East Providence, R. I., and Eben Norton Horsford, Cambridge, Mass.

We claim the use of the kettle or common receptacle for mixing together the viscid mass resulting from each day's work, after partial crystallization, with farinaceous diluents, in the manner and for the purpose above set forth.

75,339.—APPARATUS FOR CONCENTRATING ACID PHOSPHATES OF LIME.—Geo. F. Wilson, East Providence, R. I., and Eben Norton Horsford, Cambridge, Mass.

We claim, 1st, The new and improved method or process of concentrating the acid phosphate of lime liquor by means of the apparatus constructed and arranged substantially as and for the purposes above described.

2d, The use of metallic evaporating kettles lined with porcelain, for concentrating the solution of acid phosphate of lime, in the manufacture of Horsford's pulverulent phosphoric acid.

3d, The improved fire pot, substantially as described, consisting of fire brick, lining a short metallic tube, or a short continuous fire-brick tube, with a surrounding air space, in connection with the use of the porcelain-lined kettle, for concentrating acid phosphate of lime liquor.

4th, The movable grate, in combination with the fire pot and porcelain-lined kettle, substantially as and for the purpose above described.

5th, The arrangement of the series or bench of single kettles above described, having a separate fire for each, in the manner and for the purpose set forth.

75,340.—EGG BEATER.—Sylvanus C. Wilson (assignor to himself, Edward Mathews and Wm. K. Strong), Central Falls, R. I.

I claim a dasher attached to the lower extremity of the rod, C, perforated with round holes, having a concave surface, upon which are soldered narrow strips of tin, passing across the center of the holes, substantially as described and for the purposes specified.

75,341.—MACHINE FOR CUTTING RAGS.—Alexander Allen (assignor to himself, W. G. Wood, John G. Walker and W. R. Walpole), Chicago, Ill.

I claim, 1st, The combination of the table, A, shears, a b, and movable bed, or guard, B, all arranged and operating in the manner and for the purposes described and set forth.

2d, In combination with said shears, a b, the rock shaft, h, arm, m, paw

wheel, C, when arranged with connecting arms and joints, substantially as specified and for the purposes described.

75,342.—FLUID METER.—Leicester Allen, New York city, assignor to himself and Solomon S. Smith, Waterford, N. Y.

I claim, 1st, The combination of the openings, b and i, with valves fixed to a pivoted arm, v', in such a manner that by the movement of the arm the openings shall always be proportionately uncovered or closed, when this combination is used in a fluid meter, substantially as and for the purposes specified.

2d, The cylinder, C, provided with the piston, D, and the opening, e, or their equivalent, when used in a fluid meter, substantially as and for the purpose specified.

3d, The chamber, J, provided with the diaphragm, m, substantially as and for the purpose specified.

4th, The arrangement, in a fluid meter, of the chambers, B B', cylinder, C, piston and rod, D D', arm v', and valves v v'', substantially in the manner and for the purposes set forth.

75,343.—MAP AND CHART HOLDER.—E. A. Apgar and A. C. Apgar, Trenton, N. J.

We claim the self-adjusting rotary compound hinge, as described, and for the purposes set forth.

75,344.—HYDRANT.—T. R. Bailey, Jr., Lockport, N. Y.

I claim, 1st, A hydrant or water-plug, constructed substantially as shown and described, that is to say, with the parts A and B connected together as shown, and with a cylinder valve and a waste water valve connected and operated in combination, substantially as herein specified.

2d, The arrangement of the parts, A B, valve, D, case, C, and stuffing box, H, as herein described for the purpose specified.

75,345.—RAILROAD CAR HEATER.—Wm. C. Baker, New York city.

I claim, 1st, A circulating hot-water apparatus, adapted to railroad cars and other vehicles, in which a rising water pipe from the heater opens into a water vessel, in combination with a descending pipe and radiating or heating tubes, substantially as and for the purposes set forth,

2d, The heating tubes, arranged as shown, to run from the side of the car beneath the respective seats, and furnish warmth to the individual passengers, in combination with the aforesaid hot water heating apparatus set forth.

75,346.—FIREPROOF SAFE.—R. A. Ballou, Boston, Mass.

I claim embedding in the filling of a fireproof safe a stratum or strata of wood, arranged substantially as described, for the purpose of enhancing the non-conduction power of the safe walls, as specified.

75,347.—SASH-STOP FOR WINDOWS AND DOORS.—Frederick Baumgartner, Brooklyn, N. Y.

I claim the combination with the sash and frame of a sliding window or door of a combined spring, A, and roller, B, arranged and operating substantially as and for the purposes herein specified.

75,348.—SELF-PROPELLING ENGINE.—N. S. Bean, Manchester, N. H.

I claim in a steam fire engine, in which the steam and pump cylinders are arranged as described, operating the wheels of the engine to propel it over the road, substantially as specified.

Also, the arrangement on the shaft driven by the steam cylinders which work the main pumps of steam fire engines of the driving wheel, d, or its equivalent, so that it can be made fast or loose on said shaft, substantially as and for the purpose specified.

Also, the combination of the axle of the steering wheel with the hand wheel, o, by means of the chains, s, windlass barrels, l, shaft, j, worm gear k, worm, m, shaft, n, substantially as and for the purpose specified.

75,349.—MOTH-PROOF BEEHIVE PORTAL.—Enoch Beard, Salem, Iowa.

I claim, 1st, The platform, H, with its crevices, D D D and E E, and flap, F, and crevice, G, when constructed and used as set forth.

2d, The back, I, when combined with the box, J, and constructed and used as shown.

3d, The box, J, separated into stories by the floor, U, when constructed and used as set forth.

4th, The tubes, T T, when constructed and used as herein shown.

5th, The drawer, C, when combined with the partition, N3, and constructed and used as shown.

6th, The slide, M, in combination with the movable cage, L, when constructed and used as set forth.

7th, The partition, N3, attached to the under surface of the platform, H, when constructed and used as set forth.

75,350.—MACHINE FOR THREADING SCREWS.—Jason A. Bidwell, East Boston, Mass.

I claim, 1st, The construction of the threading clamps or dies, E E, with cutters and recesses, in such manner as to form counterparts of the screws which they are designed to produce, substantially as described.

2d, The application of threading clamps, E E, to laterally vibrating jaws or carriers, E1, in combination with a device for holding screw blanks while they are being threaded, substantially as described.

3d, The laterally vibrating and rectilinear reciprocating die carriers, E1 E1, in combination with the leader screw, c, substantially as described.

4th, The application of elastic yielding half-nuts, d d, to vibrating threading die carriers, E1 E1, substantially as described.

5th, The combination of closing cams, B B, and opening spring, e, with the threading die carriers, E1, substantially as described.

6th, The combination with the machinery substantially as herein described, for producing threads on screw blanks, of the griping jaws, g g, and cams, g1 g1, applied and arranged so as to operate substantially as herein described.

7th, In a machine for producing threads upon screw blanks, the griping jaws, g, cams, g1, and toggles, h1, combined with a sliding collar, H, and applied to a spindle, all substantially as described.

8th, The arrangement of the devices specified for adjusting the cams, g1 g1, in the screw blank threading machine, herein shown and described, for the purpose set forth.

9th, In a screw thread cutting machine employing an intermittent rotating spindle carrying the blank-holders, the index wheel, O, with its dog, p p, applied substantially as described.

10th, In combination with the wheel, O, with its dogs, p p, the vibrating lever, N, latches, P P1, and lever, L, said parts being applied to a screw cutting machine, so as to operate substantially as and for the purposes described.

11th, The spring arms, M M, the lifting lever, N, right and left latches, P P1, and the vibrating lever frame, L, carrying the shifting gear, L1 L2, all combined and applied to a screw threading machine, substantially as described.

12th, The pitman rod, L3, with its check stud, n, and the slotted guide, n1, in combination with the lever frame, L, substantially as described.

13th, Providing the lever frame, L, with right and left latches, P P1, for arresting this frame at the termini of its strokes, said parts being applied to a screw threading machine, and operating substantially as described.

14th, The driving of the leader screw shaft, F, and the griping jaw, carrying spindle, G, by means of a single wheel, J, which receives intermittent rotary or oscillating motions from shifting wheels, L1 L2, substantially as described.

15th, The adjustable yoke, B1, applied upon the cam rods, B B, for the purpose of regulating the amount of lateral vibration of jaws, E1, carrying threading dies or cutters, E, substantially as described.

75,351.—LAMP CHIMNEY CLEANER.—James S. Black, Oakland, Ill.

I claim the disk, D, in combination with the springs, B, and sliding central rod, C, all arranged as described, whereby the springs are prevented from bending inward as they are extended, as herein shown and described.

75,352.—MACHINE FOR CUTTING HOOPS FROM THE EDGE OF A BOARD.—S. C. Blian, J. J. Alvord and H. Brewer, Tecumseh, Mich., assignor to S. C. Blinn.

We claim the combination of the knife, K, arms, M and M', and guides, N and N', with the crank, R2, pitman, K', and rods, L, when the parts are constructed and arranged to operate so as to permit the knife to travel with a reciprocating and curved transverse movement, substantially as set forth.

75,353.—KNITTING MACHINE.—Henry Bogel, Watertown, Wis.

I claim, 1st, The arrangement of the grooves, p, q, r and S, in the lower surface of the plate, D, in connection with the movable plate, t, whereby the groove, S, may be closed, and the grooves, p and r, connected directly with each other, all as set forth.

2d, The plate, M, sliding on the plate, D, and operating the plates, t, and arms, g' and h', substantially as and for the purposes herein shown and described.

3d, The device for taking up the slack of the thread, consisting of the bars, c' (or d'), in combination with springs, e', and arms, g' (or h'), the latter being operated by the plate, M, all made and operating substantially as herein shown and described.

4th, The elastic extension, b', of the spools, I, and the bars, c' (or d'), for taking up the slack of the thread, substantially as described.

5th, The slotted latch opener, N, in combination with the thread holder, l, and supports, E K, of the spool, all made and operating substantially as herein shown and described.

75,354.—LANTERN.—Wm. H. Bonnell, Buffalo, N. Y.

I claim the combination and arrangement of the springs, I I, with the rims, A or B, and openings, C C, as and for the purposes described.

75,355.—WELL BORER.—Geo. W. Bowen, Fort Wayne, Ind.

I claim, The circular plate, D, for well cleaning, when provided with holes, a, for the purpose of allowing the escape of water from the dirt or sand, being lifted from the well, as herein set forth for the purpose specified.

2d, The plate, D, having spring cutting edges, all formed in one piece and provided with holes, a, as and for the purpose specified.

3d, The application of the ropes to the plate, D, for the purpose of elevating the tool from the well, as and for the purpose specified.

4th, The tool for cleaning wells, constructed as described, consisting of the perforated disk, D, having spring cutting edges, surrounded by the rim, F, and provided with adjustable handle, A B, as herein shown and described.

75,356.—GATE.—John Bowers, Clinton, Wis., assignor to Elijah W. Blaisdell, Jr., Rockport, Ill.

I claim, 1st, The extension of the main levers, F F, and the application to the lower end of the same of the balance weight, A.

2d, The double pulley block, with dead-eyes to keep the cord on the pulleys, suspended on a single rod, or working with journals in the head of the gate, and operating with a swinging or lateral motion on the opening and shutting of the same, as shown by diagram.

75,357.—CAR TRUCK.—Alfred Bridges, Newton, Mass.

I claim the combination of the journal boxes and housings with the links for supporting the car body, and the cross-heads upon which said links are held, in the manner described, so that the said boxes, while having a free, lateral motion, shall be prevented from twisting in their housings, as herein shown and set forth.

75,358.—TRUNK.—James H. Burnett, Jr., Newark, N. J.

I claim in combination with a trunk constructed as described, the lid, X X, made in two sections, hinged together, one section being also hinged to the front edge of the trunk at Y, and the other adapted to fit against the vertical part of the trunk, both forming an obtuse angle, the removable partition, A2, in the body of the trunk, and the hat receptacle, as herein shown and described.

75,359.—HAT BUCKLE.—J. N. Burton, Senoia, Ga.

I claim as a new article of manufacture a ticket-holding attachment for hats, consisting of the buckle, A, carrying the spring, C, all made and operating substantially as herein shown and described.

75,360.—COMBINED KNOB LATCH AND DOOR LATCH.—Henry W. Busse, Chicago, Ill.

I claim the combination in a door lock of the latch, B, provided with a notch, b, the bolt, C, provided with a slot, c, and notches, e f, the bent arm, D, the bar, F F', provided with a tongue, i, the spring, a a', and the plate, G, all arranged and operating substantially as and for the purposes specified.

75,361.—UNIVERSAL JOINT.—J. J. Butts and A. S. Stone, Plainview, Minn.

We claim the ball, B, and arms, A A, constructed and connected substantially in the manner and for the purpose specified.

75,362.—PIANO FORTE.—L. Caldera and L. Montu, Turin, Italy.

We claim, 1st, The method of prolonging the vibrations of the strings of a piano, substantially in the manner and by the means herein shown and described.

2d, The combination, with the ordinary striking hammer, damper, and other parts of the action of a piano, of an auxiliary or vibrating hammer and clock work, or equivalent mechanism for imparting the desired motion to the same, substantially in the manner and for the purposes herein shown and described.

75,363.—LAMP BURNER.—Geo. J. Capewell, West Cheshire, Conn.

I claim, in a lamp burner, such as herein described, the rim, B, and standard, B2, provided with the springs, c and d, when the latter are constructed and arranged in the manner as herein shown and specified, and for the purposes set forth.

75,364.—ANGULAR SHAFT COUPLING.—John M. Case, Athens, Ohio.

I claim the combination of the oblong frames, C, having cogs or teeth, c', formed upon the ends of their forward sides, and the pivoted connecting bars, D, with each other, and with the ends of the connected or coupled shafts, substantially as herein shown and described, and for the purpose set forth.

75,365.—INSULATOR.—Alfred H. Castle, Ann Arbor, Mich.

I claim, 1st, A telegraph insulator or bracket, constructed with a groove, E, substantially as and for the purpose set forth.

2d, The cavity or chamber, B, and groove, E, in combination with the bracket, A, substantially as set forth.

75,366.—ELEVATOR.—Simeon B. Castle, Cortland, N. Y.

I claim, 1st, The slotted frame, A, in combination with the cross-head elevators, B, for the uses and purposes set forth.

2d, The adjustable table, b, in combination with the elevator heads, for the purpose described.

3d, The quadrant-shaped bars, c' c', in combination with the frame, A, and axle of the driving wheels, for the purpose of raising and lowering the main apparatus.

75,367.—BUNG.—N. L. Chappell, New York city, and C. H. Pettit, Jersey City, N. J.

We claim, 1st, The sliding dogs, C, formed with inclined planes or faces, c', and operated by the eccentric grooves, c, in combination with the two parts or portions, A B, substantially as and for the purpose herein set forth.

2d, The spurs, or projections, f, formed upon the lower part, B, of the bung, substantially as and for the purpose specified.

75,368.—HAND CORN SHELLER.—Charles Christian, Milwaukee, Wis.

I claim, in combination with the hand corn sheller, A A, the curved guard-plates, D D, substantially as and for the purpose set forth.

Also, in combination with the hand corn-sheller, A A, the set screw, E, substantially as and for the purpose set forth.

Also, a hand corn-sheller, constructed with the plates, A A, as described, and provided with the guard plates, D D, springs, I I, and set screw, E, substantially as and for the purpose set forth.

75,369.—CLAMP FOR SCRUB BRUSH.—Charles B. Clark, Buffalo, N. Y.

I claim constructing the sliding collar, c, with the flange, s, when arranged on the inclined shank, d, and operated by a nut, E, in the manner and for the purpose shown and described.

75,370.—RAILWAY CHAIR AND FASTENING.—Dominicus N. Clark, Eastport, Me.

I claim, 1st, The chairs, C, clamps, E, ties, F, and sleepers, B, when said parts are constructed and combined with each other, substantially as herein shown and described, and for the purpose set forth.

2d, The combination of the iron ties, F, having an enlargement or shoulder, f1, upon each end, with the chairs, C, substantially as herein shown and described, and for the purpose set forth.

3d, The combination of the intermediate ties, F, constructed with stationary jaws, f2, and shoulders, i3, formed upon them, and removable jaws, i4, with the rails, A, and sleepers, B, substantially as herein shown and described, and for the purpose set forth.

75,371.—HEAD BLOCK.—Thaddeus L. Clark, Mt. Vernon, O.

I claim, 1st, The indicating wheels, K K, provided with grooves, x x, and different series of figures on their peripheries in combination with the indicators, j j, as and for the purpose set forth.

2d, The combination of the shafts, C C, indicating wheels, K K, and ratchet wheels, D D, with the housings, H H, quadrants, I I, and levers, E, when constructed and operated substantially as described and used for the purpose set forth.

75,372.—LOCK FOR FRUIT BOXES, ETC.—Charles Colby, Madison, Wis.

I claim, 1st, Fastening and holding the band or cord of the box by means of a single loop, m, with double grooves, b c, which double, forms a hook which keeps the loop in mortise or slot, k; also the double groove, d e f, which, when bent, forms a groove to receive and hold the end, e e, of band or strip, substantially as set forth and described.

2d, In combination with the subject matter of the above, the double bearings or rests, n n, for the bottom of the box, substantially as set forth.

75,373.—COTTAGE CHAIR.—Claudius O. Collignon (assignor to himself and Nicholas Collignon), Closter, N. J.

I claim the combination of the back, A, seat, B, and brace, F, with the grooves, h, and bar, G, and their several connections, as and for the purpose set forth.

75,374.—WATER CLOSET VALVE.—William S. Cooper, Philadelphia, Pa.

I claim, 1st, The valve, D, constructed as described, and provided with the cup leathers, e and e', substantially as specified.

2d, The fixed hollow central stem, m, of the cap, C, with the water passages, k, in combination with the valve, D, and chamber, B, substantially as set forth.

3d, The combination of the regulating screw, H, fixed central stem, m, of the cap, C, passages, k, and chamber, B, substantially as described and for the purpose specified.

75,375.—WATER CLOSET.—Wm. S. Cooper, Philadelphia, Pa.

I claim, 1st, A water closet top plate, provided with lug, R, so constructed that the horizontal lever, L, may be raised higher than the top plate, as and for the purpose specified.

2d, A water closet articulated lifting rod, R', combined with lever, L, piece, C D, and thumbscrew, T' S', constructed and operated in the manner and for the purpose above set forth and described.

75,376.—VALVE COCK.—Wm. S. Cooper, Philadelphia, Pa.

I claim the combination of the valve, n, spindle, H, with its screw, S, the cap, C, with its chamber, M, and waste passage, t', substantially as specified, and for the purpose described.

75,377.—REFRIGERATOR COFFIN.—J. S. Cox, Delaware, O.

We claim the double walled refrigerator coffin, constructed as described, with the ice chambers, a c, at the head and foot of the corpse chamber, b, said ice chambers having exterior openings, f f, for the escape of water, and communicating with the corpse chamber containing the rack, by means of openings in the bottom of the inner walls of said chambers, as herein described, for the purpose specified.

75,378.—CREASER FOR CLOTH.—W. J. Crane, Carbondale, Pa.

I claim the creasers, C, a a', and D, constructed as described, combined with the clamp, A, and set screw, b, as and for the purpose set forth.

75,379.—DESK AND SEAT.—Robert Cruikshank, Lawrenceville, N. J.

I claim, 1st, Connecting the lower end of a curved arm, D, with the end frames, A, by means of sliding blocks, E, and horizontal guide rods, F, substantially as herein shown and described.

2d, The combination of the rubber block, G, or equivalent spring, with the guide rod, F, and with the sliding block, E, said spring or rubber block being placed in such a position that the said sliding block will strike against it, both when the seat, C, is in a horizontal and when in a vertical position.

3d, The supporting end pieces, A, when cast with dovetailed upper ends, adapted to fit into corresponding grooves formed in the under side of the top, B, of the desk, as herein shown and described, for the purpose specified.

75,380.—CORN PLANTER.—Wm. Daggett, 4th, Cordova, Ill.

I claim, 1st, The gage, a2, for regulating the size of the cavity, a3, in the plunger, E, of a hand corn planter, substantially as described.

2d, The corn planter constructed as described, and consisting of the box, A, having partitions, D d, spring plate, a, scraper, G', plunger, E, having cavity, a3, gage, a2, and pin, a1, all constructed, arranged, and operating as set forth.

75,381.—UMBRELLA RUNNER.—Anthony G. Davis, Watertown, Conn.

I claim the cylinder, A, and flanged cap, a, in combination with the head, b', the latter being constructed of the slotted strip, B shaped as described, and arranged in such manner that the slots lie contiguous to each other, the bends between being solid metal, substantially as and for the purpose set forth.

75,382.—CRIBBING PREVENTER.—Benjamin J. Davis, and Isaac S. Cramer, Sergeantsville, N. J.

We claim the parts, C, and B, the one sliding within the other, in combination with the pricking point, a, and spring, s, all substantially as shown and described, for the purpose of preventing horses from indulging in the so-called habit of cribbing, all as set forth.

75,383.—HARVESTER.—John S. Davis, Tiffin, Ohio.

I claim, Attaching the adjustable bar, G', to a harvester in such a manner that the finger bar, H, and connecting rod, h, may be held in the same line, or parallel with each other, as and for the purpose set forth.

2d, The adjustable arm, G, in combination with the frame, C, and shoe, E, as and for the purpose specified.

3d, The block, x, in combination with the adjustable arm, G, shoe, E, and frame, C, substantially as and for the purpose set forth.

4th, The arrangement of the seat, K, with the bar, M, so that middle of said seat is in a line with the middle of the axle, A, substantially as and for the purposes set forth.

5th, The draw irons, L L, in combination with the cross bar, N, draft pole, T, and arm, M, as arranged and for the purpose specified.

6th, The arrangement of the frame, C, beneath the axle, A, with the draw irons, L L, tongue, T, and bar, M, so that the rear end of the said frame, C, may be raised or elevated without elevating or throwing up the driver in the seat, substantially as specified and for the purpose set forth.

75,384.—WINDMILL.—William C. Day, Mohawk, N. Y., and Pardon B. Day, Shelby, Minn.

We claim, 1st, The arrangement of chain or rope, C, windlass, B, and pulleys, e f, with the doors, A, surrounding the wind wheel, E, substantially as shown and described.

2d, The combination of chain or rope, C, doors, A, and springs, D, substantially in the manner as and for the purpose set forth.

75,385.—HOP-PICKING TOOL.—John Dean, Baraboo, Wis.

I claim, 1st, A hop-picking instrument, consisting of a rake, having curved teeth, C, and cutters, D D, at the ends, substantially as herein shown and described.

2d, The diamond-shaped teeth, C, with concave front edges, substantially as and for the purpose herein shown and described.

75,386.—GRAIN DRYER.—Julius De Bary, Offenbach, Germany, assignor to William Einstein, New York city.

I claim, in a malt and grain-drying machine, the outer wooden case, A, inner metallic case, a, with an interposed air space, the adjustable endless main scrapers, E, perforated plates, G I, imperforate plate, H, pipes, I K, and zigzag hot air flue, D, when constructed, arranged, and operating as described, for the purpose specified.

75,387.—VALVE GEAR FOR STEAM ENGINE.—Edward N. Dickerson, New York city.

I claim, 1st, A reversing link, vibrated by one eccentric, capable of being moved in the direction of its length for reversing, suspended at its neutral point by a radius bar, or other equivalent device, upon which it vibrates, and upon the opposite side of which it works the valve for the forward and backward motion of the engine, substantially as described, in combination with an independent cut off apparatus of any sort, for closing the ports which it opens.

3d, An independent cut off apparatus, adjustable while the engine is in motion, by altering the angular position of the eccentric which works the independent cut off slide, in reference to the line of the crank, substantially as described.

3d, The combination of a pin or block fixed in the main shaft, with a pipe surrounding the main shaft, to which the cut off eccentrics are fixed, and with an exterior sliding sleeve surrounding the said pipe, provided with two grooves, one of which receives the end of the fixed pin, and the other of which receives a block or pin fixed upon the eccentric pipe, and one or both of which grooves are spiral, as a device for the purpose of varying the angular position of the cut off eccentrics upon the main shaft, substantially as described.

4th, A graduated opening, through the main port, or valve, in combination with the exhaust openings, so arranged as that one exhaust aperture will be opened before the other closes, and with an independent adjustable cut off for the purpose of preventing a "cushion" of the steam and the shock of sudden admission, without "wire drawing" through the graduated opening in cutting off, substantially as described.

75,388.—CARD-SETTING MACHINERY.—Thomas A. Dickinson, Worcester, Mass.

I claim, 1st, The round slide, M, constructed and operating as described.

2d, The combination of the slide, M, slide, i, link, P, and lever, Q, in the manner described.

3d, The mode described of clamping the wire to the slide, M, by means of the jaw, L, and spring, K, operating as specified.

4th, The clamping jaws, c d, operated by the spring, S, substantially in the manner set forth.

5th, The cutter cylinder, V, constructed and operating as described.

75,389.—DOOR OF FIRE PROOF SAFE.—William B. Dodds (assignor to Dodds, MacNeale & Urban), Cinn, O.

I claim the provision, in a fire proof safe, of the auxiliary door, C, hinged to, and when open, affording access to, the entire lock and door bolt movement and filing of the door proper, as set forth.

75,390.—LAMP SHADE.—T. B. Doolittle, Bridgeport, Conn., assignor to himself, George Doolittle, and George H. Dimond.

I claim, 1st, A lamp shade or reflector, formed of sheet metal, adapted to be applied to the chimney of a lamp, and so corrugated or crimped as to be capable of sufficient spring or elasticity to permit it to be sprung on to the chimney, substantially as described.

2d, The employment, in combination with a shade or reflector, of a spiral or coil spring or springs, arranged in the upper edge of the shade, so as to roll over a spring back, substantially as described for the purpose set forth.

3d, Forming a corrugated or crimped metallic shade, with projecting metallic teals or lips, s s, substantially as described for the purpose set forth.

75,391.—APPARATUS FOR TANNING IN VACUO, AND FOR OTHER PURPOSES.—Charles Doty, St. Louis, Mo.

I claim the vessels, A and B, when coupled together with the pipe, D, and otherwise provided with the cocks, C a', and h, and doors, a b, all arranged and operated substantially as herein shown and described.

75,392.—SAFETY VALVE.—S. B. Dougherty, Bordentown, N. J., assignor to himself and John Ashcroft, New York city.

I claim the arrangement of the cylinder, A, with its perforations, f f, annular chambers, E a H, and valve seats, i i, substantially as described and set forth.

Also, the construction of the inner cylinder, or double seat valve, K, with its recess, L, shoulder, m, seats, k and k', and internal steam exit opening, n n', substantially as set forth and described.

75,393.—MODE OF IMITATING CLUSTER JEWELRY.—William O. Draper, Albert C. Sweetland, and George H. Draper, North Attleboro, Mass.

We claim the method of constructing cluster work jewelry, substantially as herein described.

75,394.—PRINTING PRESS.—A. A. Dunk, Philadelphia, Pa.

I claim, 1st, The combination of the form cylinder, D', the cylinder, G, separated into as many segmental platens as there are forms on the said cylinder, D', and nippers, constructed in the manner described, or any equivalent to the same, but, in number one in excess of that of the forms or segmental platens, and arranged to revolve in a circle larger in diameter than, but eccentric with, that of the platen roller, all substantially as and for the purpose herein set forth.

2d, The grooves or channels, b, of the cylinder, G, and intervening segmental platens, in combination with the series of nippers, so many in number in respect to the grooves, and revolving in a course so eccentric with that of the cylinder that each set of nippers will transfer a sheet from one platen to the other, and will find its way from one groove to another, all substantially as and for the purpose herein set forth.

3d, The said revolving nippers, moving in a circle eccentric with the cylinder, G, having segmental platens, in number, one less than that of the nippers, in combination with the devices herein described, or any equivalent to the same, by the aid of which the paper, carried by any one set of nippers, shall be released, but not before it has been carried round as many times as there are platens on the said cylinder.

75,395.—ANVIL CUTTER.—Valmore A. Dunn, West Peru, Me.

I claim the improved shears, composed of the fixed arm, b, and jaw, B, lever, C', C, and spring, D, combined and arranged in manner substantially as above set forth and described.

75,396.—SASH BEAD FASTERER.—Daniel W. Dyer, and James H. McVaugh, Philadelphia, Pa.

We claim the catch, E, constructed substantially as herein shown and described, in combination with the slotted plates, F and D, beads, B and C, either or both, and casing, A, as and for the purpose herein set forth.

75,397.—SEAT FOR VEHICLE.—Walter A. Eddy, East Randolph, N. Y.

I claim the arrangement of the lever, B, with the connecting rods, C C, plates, D D, when secured or adjusted to the bottom of a seat, A, for the purpose of securing the same on a buggy, wagon, or cutter top, substantially as and for the purpose herein set forth.

75,398.—BOOT AND SHOE.—Henry Eldridge, Lynn, Mass.

I claim suspending and combining the rolls of material in the manner described, whereby they may be unwound and lapped one upon another, essentially as herein shown and specified.

75,399.—WRENCH.—John J. Ellis, Auburn, N. Y.

I claim the shank, B, extending through the handle, A, and furnished at one end with a screw thread, upon which is screwed hammer, C, the opposite end of shank B being formed with a jaw, all arranged in combination with jaw, D, and slide, E, substantially for the purpose set forth.

75,400.—PETROLEUM OR GAS STOVE.—D. L. Emerson, Rockford, Ill.

I claim the oil reservoir, D, and lamp, D, as one vessel, in combination with the tubes, B B, and burners, E E', and F F', constructed as described and operating as and for the purposes set forth.

75,401.—HARVESTER.—E. W. Fairman, Orfordville, Wis.

I claim the hinged or pivoted plate, A*, combined with the lever, E, cam wheel, C, and lever, G, arranged and operating substantially as and for the puopose specified.

75,402.—FILING MACHINE.—Moritz Fiedler (assignor to himself and to John Klein), Rochester, N. Y.

I claim the combination of the table, a, toothed segment, d, and worm, c, with the slotted pitman, n, and crank, r, arranged substantially as described.

75,403.—CORN HUSKER.—Charles Ford, Forest city, Ill.

I claim, 1st, A serrated feed hard roller, H, and rubber roller, I, used, as herein set forth, for husking corn, by catching the husk and stalks and passing them through beneath, while the ear is left on top.

2d, The rollers made, as herein set forth, fig. 2, smaller for near one third their length at the front end, to admit the stalks between the rollers.

3d, The use of the gain thread, J, which increases the acuteness of its angle with the roller, as it runs back, see fig. 2, from the point to the swell of the rollers, thereby pulling the cornstalk gently over at first, but more quickly afterward, and also keeping the stalks parallel with the threads that pull them, thus avoiding the danger of breaking them off before they get into the hopper.

4th, The use of the right hand gain thread, on the front end of the left hand roller, and the left hand gain thread, see fig 1 J, on the right hand roller, in connection with the inward and downward motion of the rollers.

5th, The dropper, F, made and used as herein set forth.

6th, The snapper, G, made and used for breaking the ears from the stalks and husk, while the latter are held firmly beneath, between the rubber and serrated rollers, and also for carrying the ears back under the presser.

7th, The presser, T, for pressing the ears down and rolling them over as it passes them back between the rubber and serrated rollers, so that any remaining husk or silk may be taken off before they pass out on to the dropper.

8th, The dropper, L, arranged as herein described, in connection with the mouth, m, of the machine, in such manner that the ear corn is delivered in a wagon, if driven for that purpose, without other assistance.

9th, The breaker, Z, made and used as herein set forth, to break the tops of the stalks back, so they will pass down between the rollers before they get far back on them.

10th, The combination of the gain thread, J, rubber roller, I, serrated roller, H, fenders, S, snapper, G, presser, T, hopper, F, dropper, L, gearing, N, and frame, D, arranged and used as herein described.

75,404.—MANUFACTURE OF VINEGAR.—Andre Foubert, New York city.

I claim an evaporating tub containing platforms and vapor tubes, in combination with the apparatus for supplying water and vinegar, and with the vat containing shavings, substantially as and for the purposes set forth.

75,405.—MACHINE FOR COILING SPRINGS.—John Freeland and Daniel Ward, New York city.

We claim, 1st, The slotted coiling spindle, e, and the sliding screw, E, in combination with the chuck, b, all constructed, arranged, and operating substantially as and for the purpose herein described.

2d, The guide rest, H, and the sliding block, I, in combination with the coiling spindle, e, constructed and operating substantially as and for the purpose herein described.

3d, The combination of the pulleys, C, the chuck, b, the coiling spindle, e, the sliding screw, E, the guide rest, H, and the sliding block, I, constructed, arranged and operating substantially as and for the purposes set forth and described.

75,406.—FABRIC FOR THE MANUFACTURE OF HATS, CAPS, ETC.—Treffé Garceau and Edward De La Granja, Boston, Mass.

We claim, 1st, The composition above described, substantially as and for the purpose set forth.

2d, The process of manufacturing hats, caps, bonnets, neckties, and ribbons, substantially as specified.

75,407.—JOINT FOR PIPES.—Benjamin Garvin and R. J. Pettibone, Oshkosh, Wis.

We claim the parts, A A, constructed as specified and used with the bolt, a, which said bolt passes transversely through both of said parts and is suitably secured on both of their outer sides by nuts and washers, or their equivalents, as set forth.

75,408.—SINGLE TREE.—George Gibbs and William Gibbs, Canton, Ohio.

We claim the tree, g, provided with the short disconnected springs, b b, loops, c c, and one or more indicators, e, for marking the numbers on said loops, all combined and used substantially as set forth.

75,409.—WHIP LOCK.—Francis M. Gifford (assignor to himself and John C. Selden), Erie, Pa.

I claim, 1st, A lock for securing a whip in the socket upon the dasher of any vehicle, composed of the arms, A, forming two sets of jaws operated by a screw, D, and key, E, and a spring, a, or its equivalent, substantially as shown and described and for the purposes set forth.

1d, The arms, A, in combination with the vibrating nut, C, and the wire spring, a, and the vibrating socket, B, and the screw, D, substantially as shown and described and for the purposes set forth.

75,410.—COTTON SEED PLANTER.—A. J. Going, M. D., Clinton, La.

I claim, 1st, The fixed metallic strips, g g, in combination with the laterally-adjustable metallic strips, h h, placed at the bottom of the hopper, I, and the radial arms, e, attached to the axle, C, and working between the strips, g g h h, all constructed and arranged for joint operation, substantially in the manner as and for the purpose set forth.

2d, The furrow opener, H, and harrow, F, in combination with the cotton seed distributing mechanism, all constructed, arranged and applied for joint operation, substantially as and for the purpose specified.

75,411.—GRINDER FOR KNIFE FOR PLANER.—John Grant, Northampton, Mass.

I claim a device for sharpening the knives of planers and similar tools, consisting of the screw, H, piece, G, wheel, D, and ground spindle, f, the parts and the whole being constructed and arranged substantially as shown.

75,412.—SURGICAL CUP.—John G. Hadfield, Cincinnati, Ohio.

I claim the provision, in a surgical cup, of a groove, a, to receive and hold an india-rubber lip, B, in the manner set forth.

75,413.—MACHINE FOR CARVING IN WOOD.—Isaac Hall, New York city.

I claim, 1st, The combination of one or more pivoted or swinging frames, I J, constructed substantially as herein shown and described, with the pivoted frame, H, as and for the purpose herein set forth.

2d, The frame, H, adjustable with relation to the pivoting frame, C, for the purpose of carving two exact copies of the pattern at the same time, or increasing or diminishing the size of the copy in exact proportion to the pattern, substantially as herein shown and described.

2d, The tracer, S, adjustably secured to the slotted bar or arm, O, of the swinging or pivoted frame, I, by means of the slotted bar, V, rods, W Y, and sockets, F Z X, substantially as herein shown and described, and for the purpose set forth.

4th, The combination of the slotted bar, V, pivoted rod, W, and adjustable pivoting rod, Y, with each other and with the tracer, S, and slotted bar or arm, O, of the pivoted frame, I, substantially as herein shown and described and for the purpose set forth.

5th, The combination and arrangement of the pulleys, L and K, with the pivoted frame or frames, I and J, frame, H, and driving pulleys, D E, for the purpose of keeping the band or bands, F, taut while operating the cutters, whatever may be the relative positions of the said frames, substantially as herein shown and described.

6th, The arrangement of the holder and frame, P, with relation to the pivoted frame, I, tracer, S, and cutter in the arm, I, substantially as described and for the purpose specified.

75,414.—MODE OF ATTACHING COLTERS TO PLOW BEAMS.—James H. Hall, Maysville, Ky.

I claim the said wrought-iron sliding plate, with its flanges, mortises, and adaptation to the purpose of regulating the position of and holding fast the cutter to a plow beam.

75,415.—FURNACE FOR SMELTING ORES OF LEAD AND OTHER METALS.—R. Henry Hall, Taunton, Mass.

I claim the application of a receiving basin, as herein described, to furnaces used for smelting ores of gold, silver, or lead.

75,416.—HAY RAKER AND LOADER.—John Harper, Hillsboro, Iowa.

I claim, 1st, The revolving rake head, G, attached to arms, E E, and used in combination with the elevating cords, I, and spool, C, and the ratchet, F', and pawl, H, said parts being arranged to operate substantially in the manner and for the purpose set forth.

2d, In combination with the frame, A, and elevating arms, E, the pieces, D, pivoted to the frame, and held extended by the pins, D', so as to permit the width of the frame to be diminished when necessary, substantially in the manner set forth.

75,417.—GRAIN SEPARATOR.—Samuel Harris, Springfield, Mass.

I claim, 1st, The combination of the slotted rod, E, having rollers, c, with the triangular surface cam, D, when used and arranged upon a sifter, substantially as herein described.

2d, In combination with the above, the double-inclined agitators, e e, etc., arranged as described.

75,418.—LAMP SHADE.—Henry M. Hartshorn, Malden, assignor to himself and Daniel Forbes, Boston, Mass.

I claim as my invention the foldiar shade made of trapezoids, connected at their edges by strips of cloth, or the equivalent thereof, so that the several sections may be either folded or unfolded, as specified.

Also, the combination, as well as the arrangement, of the series of sectional supporters, c and a folding shade composed of a series of trapezoids, a, arranged and connected or hinged together at their edges, substantially in manner as specified.

75,419.—SUBSOIL ATTACHMENT FOR PLOWS.—Charles Hayden, Collinsville, Conn.

I claim, 1st, The share standard, F, fitted in the plates, E G, and retained at the desired hight by the pin, d, in one of a series of holes, c, substantially as and for the purpose specified.

2d, The combination of the lever, I, and pins, e, with the share standard, F, all constructed, arranged and applied substantially in the manner as and for the purpose set forth.

75,420.—CAR COUPLING.—G. W. Haynie, Olney, Ill.

I claim, 1st, The combination of the segmental cam pinion, B b, and coupling pin, E e, when the same are adapted to be operated by the coupling link, substantially as described.

2d, The spring, F, applied and operating substantially as and for the purpose specified.

75,421.—SCRUB BRUSH.—Daniel E. Hayward, Malden, Mass.

I claim, as an article of manufacture, the brush as described, viz., when composed of alternate rows of rubber and bristles.

75,422.—CLOTHES PIN.—D. K. Hickok, Morrisville, Vt.

I claim the blocks, A and B, constructed substantially as described, and connected together by means of the bands or elastic straps, C C, as and for the purpose set forth.

75,423.—TRAMMEL FOR STAIR RAIL.—George Hoover, Richmond, Ind.

I claim, 1st, The herein-described tram, composed of the cylinder, F, and arm, E, in combination with rod, I, substantially as described, and for the purpose set forth.

2d, The horizontal rod, I, vertical adjustable rods, G and H, in combination with the collars, K and K, clutches, J and J, and draft board, A, substantially as set forth and for the purpose specified.

75,424.—STEAM WATER ELEVATOR.—William L. Horne, Batavia, Ill.

I claim the combination of the siphon, n, with the steam water elevator, constructed and operated substantially as herein set forth.

75,425.—CLOTHES WRINGER.—Robert B. Hugunin, Cleveland, Ohio.

I claim the arrangement of the right and left helical gear wheels, B and B', in combination with the elastic rollers, A and A', end pieces, C and C', journal blocks, E and E', spring bars, F and F', stop, H, and adjusting screw, J, substantially as and for the purposes specified.

75,426.—STOPPING AND STARTING CARS.—C. S. Hunt, Parish of Terre Bonne, La.

I claim, 1st, The loose pulleys, F F', on axle, C, in combination with chains, E and E', and spring, D, arranged and operating substantially as and for the purpose set forth.

2d, The loose pulleys, F F', chains, E E', and spring, D, in combination with clutches, G G, and their actuating levers, arranged for joint operation substantially as described.

75,427.—LIFTER AND TONGS.—John Hyslop, Jr., and Charles E. Phillips, Abington, Mass.

We claim the lifter and tongs, constructed as described, consisting of the parts, A B, pivoted together, the part, B, provided with a longitudinal slit for the passage of the part, A, and having at its forward end the double lips, d d and e e, the part, A, having the lip, b, and the lip, c, provided with the shoulder, dx, all arranged and operating as described for the purposes specified.

75,428.—MACHINE FOR SHAPING THE SOLE OF A SHOE.—Jos. B. Johnson, Lynn, Mass.

I claim the combination of the rotary bar, u, or the same and the auxiliary last, v, with the main last, u', the mold, A, and the press.

Also, the application of each last, u' v', to the rotary bar, u, so as to be capable of being revolved on an axis passing through or extending from the last.

Also the application of the mold, A, to the arch bar of the press, by means substantially as described, or the equivalent thereof, whereby such mold is enabled, under pressure of the sole against it, to adjust itself to the sole.

Also the combination and arrangement of the facing plate, z, with the last and its elastic cushion, y, applied thereto as represented.

Also the combination of the slide bar, k, the wedge, m', and the auxiliary treadle lever, o, with the toggles and their operative pitman and treadle lever.

Also each last as made with the extra or lower foot, arranged with the main foot, and being for the purposes as set forth.

75,429.—GAS HEATER.—Daniel Kellogg, Jackson, Mich.

I claim, 1st, The employment of a revolving disk, substantially as shown and described, for the purpose of spreading the flame of a gas or oil stove, all as set forth.

2d, The adjustable dish, H, in combination with the burner, b, and disk, K, substantially as and for the purpose shown and described.

3d, The rod, e, and elevating screws, m m, for adjusting the hight of the disk above the burner, substantially as shown and described.

4th, Providing the rod, e, with a screw thread or other equivalent device, for the lateral adjustment of the disk, substantially as and for the purpose shown and described.

5th, The ring damper, G, in combination with the disk, K, substantially as shown and described and for the purpose specified.

75,430.—HORSE HAY FORK.—George Kinney, Bristol, Ind.

I claim the combination of the stem or central prong, A, cross bar, B, side prongs, C, arm, D, pivoted hooks or fingers, E, shield, F, and trip lever, G, with each other, said parts being constructed and arranged substantially as herein shown and described and for the purpose set forth.

75,431.—ARTIFICIAL TEETH.—A. A. Knowlton, St. Albans, Vt.

I claim artificial teeth provided with holes, formed with a screw thread, when secured to a vulcanite or rubber base, b, by means of screws, d, of the same material, all constructed and arranged substantially as and for the purpose set forth.

75,432.—HYGROMETER.—A. E. Lazell, West Meriden, Conn.

I claim the curvilinear strip of wood, constructed as described, and having one of its surfaces rendered impervious to moisture, in combination with an index, substantially as and for the purpose specified.

75,433.—FAGGOT FOR RAILROAD RAIL.—William Leighton, Wyandotte, Mich.

I claim the Y or dovetail shaped piece of steel, with V-shaped top, in conjunction with any suitable faggot which will make a rail, as shown in fig. 2.

75,434.—CATAMENIAL SACK.—H. W. Libbey, Cleveland, Ohio.

I claim the sack, A, having the elastic pieces, a a, in each side to give it shape, and the elastic band, B, in combination with the adjustable belt, D, all constructed in the manner described, as and for the purpose set forth.

75,435.—CORN PLANTER.—Noyes Liddell and Morris Liddell, Lafayette, N. Y.

I claim, 1st, the combination and arrangement of the tube, C, lever, E, pin, D, and bell, H, for the purpose described.

2d, The slide, J, as described.

3d, The method described of adjusting the feed wheels on the shaft, O.

4th, The method described of throwing the shaft, O, in and out of gear.

75,436.—CULTIVATOR TOOTH.—M. F. Lowth and T. J. Howe, Owatonna, Minn.

We claim the combination of the beam, A, having the mortises, m n, as described, with the link, c, wedge, w, and hinged tooth, T, having the brace, B, substantially as and for the purposes set forth.

75,437.—STRAW CUTTER.—C. A. Lundy, Marshalltown, Iowa.

I claim the box, A, provided with the V-shaped knife, in combination with spring, N, feeder, L, gate, H, spring gage, m, all arranged in the manner herein set forth and described.

75,438.—ANIMAL TRAP.—M. B. Marshall, Draw Bridge, Md.

I claim, 1st, In an animal trap, a table, A, having two slots, a a, and a central aperture, B, and provided with legs, c c c c, and standards, D D', substantially as and for the purposes specified.

2d, The combination of the spring pole, O, cords, C e e, bar, N, rods, R and T, and chokers, o o o, substantially as and for the purpose set forth.

3d, The notched and graduated bar, N, when used in a trap of this description, substantially as and for the purpose set forth.

75,439.—LAMP BURNER.—George A. Mason, Chelsea, Mass.

I claim, 1st, The arrangement of a chimney sustaining spring, intermediately between the deflector or cone, C, and the base, A, of the lamp top, substantially as and for the purpose set forth.

2d, The guide piece, G, and socket, D, in combination with the base plate, A, and wick tube, B, when said guide piece and socket are constructed as and for the purpose herein specified.

75,440.—TREBLE-TREE.—W. W. Mathews, Yates City, Ill.

I claim, 1st, The staple attachment, D E, of the inner ends of drawing bars, a a, and

2d, The curved hook, b, shown in fig. 2, each and all substantially as shown, and in combination as and for the uses and purposes herein expressed.

75,441.—MODE OF PRODUCING MOTION FOR SAWING MACHINES.—James W. Maxey, Plymouth, Ind.

I claim the hand levers, F F, operating alternately, and connected to wheels, D and B, by pitmen, E E, and combined with shaft, B, wheel, G, shaft C, drums, H, and balance wheels, I I, when constructed to operate substantially as described.

75,442.—MODE OF PRODUCING HOT BLAST IN FURNACES.—Theodore McDowell, Light Street, Pa., assignor to T. McDowell and A. McDowell.

I claim the engine, c', pump, c, pipes, I, vessels, F, and chamber, H, when combined substantially as and for the purpose explained.

75,443.—TUMBLER WASHER.—J. P. Milburn, Washington, D.C.

I claim, 1st, The combination with the central pipe over which the tumbler is placed, of an annular pipe or a series of pipes for discharging water upon the exterior of the tumbler, and a valve mechanism operated by the weight of the tumbler, so as to admit water to both the central and the exterior pipe or pipes, substantially as and for the purposes herein shown and set forth.

2d, The arrangement of the nozzles or orifices through which water is discharged upon the exterior of the tumbler in the manner described, so that the jets of water shall be discharged tangentially or thereabouts to the tumbler, substantially as and for the purposes herein shown and set forth.

3d, The combination with the central pipe of the annular or exterior pipe and adjusting screws or equivalent mechanism for regulating the pressure of water in the said pipe, substantially as and for the purposes herein shown and specified.

75,444.—HARVESTER.—Charles G. Miller, Springfield, Ohio.

I claim, 1st, Stopping the rake automatically at the rear of the platform during each alternate revolution of the driving wheel, by means of the herein described mechanism, or the equivalent thereof, for the purpose set forth.

2d, The combination of the stud, s'', eccentric, n', and pinions, p', and A', with the hubs of the driving wheel and rake's crank, substantially as described, for the purpose of throwing the rake in or out of gear automatically, as described.

3d, The combination and arrangement of the foot lever, g'', collar, g', clutch pin, h', running through the arm of the driving wheel into the driving pinion, A, for the purpose of throwing the rake out of gear at the will of the attendant.

4th, The combination of the catch, b'', on the end of the hub of the driving wheel, C, the collar, j', provided with the catches, o'' and f4'', and the catch, a'', on the hub of the rake crank, substantially as and for the purpose set forth.

5th, The shoe, P, constructed as described, so that it may be adjusted and fixed at its forward end, in the manner set forth.

6th, The reel post, Q, mounted upon the inner shoe, and curved forward, so that the attendant may grasp its upper end as a lever to raise the outer end of the cutting apparatus from the ground, as set forth.

7th, The sliding carriage, t, connected with the rake head by the arm, u, and link, v, arranged substantially as set forth, so as to push the rake backward with the teeth vertical, and draw said rake forward again with the teeth horizontal.

8th, The reel sliding head, t'', constructed with the loose nut bar, p'', as and for the purpose set forth.

9th, The spring latch, s', constructed as described and for the purpose set forth.

10th, The construction or arrangement of the cutting apparatus, shoe, P, automatic reciprocating rake, reel, P', and their operating mechanism, in relation to the main frame, so that the cutting apparatus, with its rake and reel, may be folded and so maintained while being moved from place to place, substantially as shown and described.

11th, The guide rods, d' and b', for the outer end of the rake, constructed and arranged as set forth and described, combined with the outer or guide tooth, n'' of the rake.

12th, The hook, and flange, v'', to retain the rake upon its side while being drawn forward, as set forth and described.

75,445.—BEDSTEAD FASTENING.—J. E. Milliken, Bridgeton, Me.

I claim the hinge, C, constructed as described, its leaves pivoted together at their upper ends, P, one leaf extending across the edge of the rail, B, and beneath it, and fitting at its angle upon the shoulder, a, of the vertical leaf secured to the post, A, all arranged as described, whereby the post, A, is adapted to swing up or down upon the pivot, P, as and for the purpose specified.

75,446.—WINDOW SHADE FIXTURE.—Jacob B. Moore, New York city.

I claim, 1st, Rolling or unrolling the curtain automatically, by means of the cord, and the small axes of the roller, substantially as described.

2d, Creating an equilibrium between the roller of the window shade and the lower rod, F, through the medium of the suspended cord and small axes D, whereby the shade is rolled or unrolled, substantially as herein shown and described.

3d, In combination with the shade suspended upon axes, D, and the lower rod, F, the weight, H, whereby the said shade is held at any desired point, substantially as described, for the purpose specified.

75,447.—CAR MOVER.—H. B. Morrison, Le Roy, N. Y.

I claim, 1st, In a car mover constructed as described, the two driving wheels, D and E, placed in line with each other, so as to run upon the same rail of the track, and connected to each other with and endless chain, F, substantially as herein shown and described and for the purpose set forth.

2d, The combination of a cede wheel, U', with the projecting end of the axle, B, of the car mover, substantially as herein shown and described, and for the purpose set forth.

3d, The driving wheels, D and E, constructed with grooves of peculiar shape for the reception of the endless chain, F, and to enable them to hug the rail more closely, substantially as herein shown and described.

4th, The combination of the elbow lever, G' R', bars, F' D' and O' K', and pawls, A1 and B', with each other and with the cog wheel, d', formed upon or attached to the driving wheel, D, substantially as herein shown and described, for the purpose of operating the machine.

5th, The combination of the adjustable slide, E', with the bars, F' and D', substantially as herein shown and described and for the purpose set forth.

6th, The combination of the adjustable slide, P', with the lever, G', and bar, O', substantially as herein shown and described and for the purpose set forth.

7th, The combination of the reversible pawl, A', having a handle, a2, attached to its upper end, and coiled spring, C', with the socket, B' and cog wheel, d', substantially as herein shown and described and for the purpose set forth.

8th, The combination of the pawl, B', having a handle, b', attached to its upper end, spring, J', arm, M', coiled spring, L', and socket arm, I', with each other and with the cog wheel, d', and bar, K', substantially as herein shown and described and for the purpose set forth.

9th, The combination of the bar, K, slide blocks, N and O, screw, P, adjustable bars, M U, slide, V, adjustable standard, R, and pivoted socket, S, with each other and with the elbow lever, T W, and frame, G, substantially as herein shown and described and for the purpose set forth.

10th, The combination of the slide bar, T', with the frame, A, of the machine, substantially as herein shown and described and for the purpose set forth.

11th, The combination of the guide stays, A2, with the shaft, H, ferrules, B2, and sockets, S, substantially as herein shown and described and for the purpose set forth.

75,448.—SUSPENDING SCALE PAN.—Richard Murdoch, Baltimore, Md.

I claim, 1st, A dish for spring balances, constructed with two or more bowed arms, a a', so operating that they can be folded together when not in use, substantially as described.

2d, The combination of the standards, a a, sliding rings, t t, and pivoted arms or bails, a a', substantially as and for the purposes set forth.

75,449.—TINNING.—Peter Naylor, New York city.

I claim the means, herein specified, for applying flux to the interior of a length of lead pipe previous to tinning the same with melted tin, as specified.

75,450.—HAY RAKER AND LOADER.—W. T. Nichols, Rutland, Vt.

I claim, 1st, The combination of the gathering and loading rake, q' q', etc., and the supplementary elastic teeth, q q, substantially as and for the purposes set forth and described.

2d, The combination of the vibrating gathering rake, and the auxiliary loading frame, f f, substantially as set forth and described.

3d, Driving the auxiliary loading frame, f, by the carrying wheels, s, or their equivalent, said wheels being attached to and vibrating with the gathering frame, q' q', substantially as set forth.

4th, The combination of the land wheel, s, pinions, b and c, cranks, d, and rock shaft, e, substantially as and for the purpose set forth.

5th, The small wheels, n n, located between the teeth q' q', and having their bearing attached to said teeth, substantially as set forth.

6th, The connecting frame, i i, attached to rake frames, as and for the purposes set forth and described.

75,451.—LUNCH BOX.—Peter H. Niles, Boston, Mass. Antedated March 6, 1868.

I claim a portable collapsing lunch box, composed of a top and bottom, in combination with double-acting end pieces and single-acting sides, substantially as described.

75,452.—HORSE HAY FORK.—S. Page, McAlistersville, Pa.

I claim the strap, D, provided with slots, x x, in the upper ends of which is a jog or offset, the rod or bar, F, and its hooks, G G, the frame, E, tines, J J, and lever, H, with its cord, the several parts being constructed, used, and operating in the manner and for the purpose set forth.

75,453.—SKATE-BUCKLING TONGS.—Wm. P. Patton (assignor to James M. Foster), Harrisburg, Pa.

I claim the within-described tongs, when constructed substantially as and for the purpose herein set forth.

75,454.—AUGER.—Ira T. Payne, Chester, Conn. Antedated February 28, 1868.

I claim the projection, C, on the floor-lip, for the purposes set forth.

75,455.—PLOW.—John D. Peck, Triangle, N. Y.

I claim the application of a cap or roof to the common farm plow, as herein described, and for the purposes herein set forth.

75,456.—FORMING HORSE-SHOE BLANK.—Charles H. Perkins, Providence, R. I.

I claim the improved double blank for horse-shoes herein described, as an article of manufacture.

75,457.—MACHINE FOR ROLLING AXLES.—Wm. P. Porter, Pittsburg, Pa.

I claim the combination of the adjustable rolls, A and B, and the roll, C, constructed and arranged in relation to one another, and to the frame which supports them, as and for the purpose herein described.

75,458.—ARMLET PORT-MONNAIE.—Aaron W. Pratt, Pultneyville, N. Y.

I claim the combination of the retaining-bolts, I, lock, f, slotted box, A o c, and retaining-bands, B B, as herein shown, and for the purpose described.

75,459.—VALVE GEAR FOR STEAM ENGINE.—Robert L. Renney, Jersey City, N. J., and John S. Cornell, Brooklyn, N. Y., assignors to John S. Cornell and H. F. Pease, Brooklyn, N. Y.

We claim, 1st, The arrangement of the cylinder, B, the valve passages, b c d e, and inlet and outlet pipes, I J, so that the steam chest, K, and cylinder cover being in one piece, may cover both the end of the cylinder, its valve, and passages, substantially as shown and described.

2d, The construction and arrangement of the valve, L, the shaft, C, and its eccentric pin, g, relatively to the cylinder, B, connecting rod, F, and rod or tram, G, essentially as shown and described.

3d, The slide valve, L, with its ears, h h, acted upon by an eccentric pin or roller on the end of the main shaft, c, as shown and described.

75,460.—WHEEL HOE.—Edmund D. Reynolds and O. Bradford Reynolds, North Bridgewater, Mass.

We claim, 1st, In combination with the center blades, h (made vertically adjustable), the rear blades, l, made adjustable, both vertically and laterally, substantially as shown and described.

2d, Supporting the vertically-adjustable standards between guide-lips, g, substantially as described.

3d, In combination with the plate to which the blades, l, are secured, the laterally-sliding supports, m, substantially as described.

4th, Forming each hoe-blade and its standard from a plate, bent both at right angles, and with an inclination rearward, substantially as shown and described.

5th, Forming the standard of the two forward blades, by welding together the two vertical plates, substantially as described.

6th, In a hoe in which the blades are made adjustable, as described, applying the handle with provision for vertical adjustment, substantially as set forth.

75,461.—COTTON BALE TIE.—E. S. Roberts, Columbus, Ga.

I claim the cotton bale tie, constructed as described, and consisting of the open box, B, provided near each end with a transverse removable pin, b, around which the hoop, A, passes, the extremities of said hoop, after passing around the pins, being bent back between the bale and the hoop, in which position they are held by the outward pressure of the bale, all arranged as described for the purpose specified.

75,462.—LATHE FOR TURNING BUTTONS.—D. C. Robie (assignor to himself and H. E. Bostwick), Springfield, Mass.

I claim, 1st, The two spindles, B and C, operated by a shipper, so as to bring them alternately against the stock at opposite sides, when constructed and arranged substantially as described.

2d, The clutch, consisting of the stationary jaw, m, and pivoted jaw, n, operated by the treadle, K, and spring, L, arranged and constructed substantially as shown, when used in connection with my device, in the manner described.

75,463.—CHANGEABLE ESCAPEMENT FOR WATCHES.—Geo. Frederick Roskopf, Chaux de Fonds, Switzerland, assignor to himself and Jules D. Huguenin, Williamsburgh, New York city.

I claim, 1st, Placing or attaching the escapement of a watch to a separate or independent plate or frame, applied or fitted to the plates or frame which contain the "train" or other portion of the watch movement, in such a manner that the escapement attached may be removed at will, and another escapement substituted therefor, substantially as shown and described.

2d, The slot, I, in the escapement plate, B, and the screw, K, inserted therein, or an equivalent means for the purpose of adjusting the escape wheel and the lever pallets in a proper relative position with each other, substantially as set forth.

75,464.—BASIN FAUCET.—Robert P. Ross, Bethlehem, Pa.

I claim, 1st, The cap, C, when made hollow for the reception of the stem of the valve, D, said valve having its seat upon the tube, A, within the chamber, B, as and for the purpose specified.

2d, The loose valve, D, in the tight cap, C, fitting into the upper end of the chamber, B, the packing, E, of said valve resting upon the upper end of the stem, A, when the water is shut off by turning down said chamber, and lifted above the end of the stem, A, when the water is turned on, by turning up said chamber, as herein shown and described.

75,465.—LUBRICATING BOX.—Thomas J. Rowley and Wm. Poland, Chillicothe, Ohio.

We claim the lubricating box, C, when provided with the central annular chamber, a, surrounding the central portion of the thimble box, B, and communicating with the wrist, A, by means of the transverse openings, c, all constructed and arranged as described for the purpose specified.

75,466.—MACHINE FOR PLANTING COTTON SEED AND CORN.—Andrew Bunstetler and Albert Windeck, Peoria, Ill.

We claim, 1st, in a convertible corn and cotton planter, the movable metallic box, O, having separating wires, w, x and y, in combination with the revolving forks, d e f, and the stirrer, P, substantially as set forth.

2d, The combination, in such a machine, of the perforated block, Q, drill, R, cut-off, S, and tongue, T, so constructed and arranged that they may be, alternately with the cotton seeding mechanism, attached substantially as set forth.

3d, The combination of the reciprocating cogged slide, I, rollers, o g, adjustable crank, K, and driving rod, J, for communicating motion from the roller, F, to the seeding mechanism of either the corn or cotton planter, substantially as set forth.

4th, The combination of the drill teeth, b, track clearers, a, and harrow, q, arranged substantially as set forth.

75,467.—LAMP.—Lewis J. Sagendorph (assignor to himself and Samuel C. Moore), Boston, Mass.

I claim the blaze cap, C, so arranged with reference to the imperforate base plate, B, as to direct the air to the flame through an annular passage or opening around the blaze cap, in the manner and for purpose specified.

Also, supporting the blaze cap by pins resting in slits in the upright flange, B', of the base plate, in the manner described.

75,468.—MACHINE FOR CARBURETTING AIR.—James Sangster (assignor to himself and Daniel H. Burtiss), Buffalo, N. Y.

I claim, 1st, The construction and arrangement of the air wheel, A, in combination with the guard, B, substantially as and for the purpose herein described and set forth.

2d, The arrangement and form of the frame, M, as and for the purpose described in claim third of this specification or description.

3d, The combination of the weight, A4, and tube, C4, as and for the purposes described.

4th, The coupling, B5, as and for the purposes herein set forth and described.

75,469.—MACHINE FOR CARBURETTING AIR.—James Sangster (assignor to himself and Daniel H. Burtiss), Buffalo, N. Y.

I claim, 1st, The combination of an air forcing wheel with a stationary air tube and a non-forcing air chamber, I, provided with openings, K, the whole being constructed to operate substantially as and for the purposes herein set forth and described.

2d, The combination of an air-floating vessel, D, and an air-discharging tube, the discharging end, E, of which projects above the carburetting liquid as and for the purposes substantially described.

3d, The supplemental tube, F2, as and for the purposes substantially as described.

4th, The tapering movable gas holder, A, as and for the purposes substantially described.

75,470.—APPARATUS FOR DISTILLING SPIRITUOUS LIQUIDS.—Wm. Shilling, Baltimore, Md.

I claim, 1st, The combination of the condenser, J, and the low-wine reservoir, L, or their substantial equivalents, with the doubler and the cooler, C, essentially as described.

2d, The combination of the low-wine reservoir, L, and condenser, J, with the cooler, C, and the meter, substantially as described.

3d, The low-wine reservoir, L, arranged in relation to the doubler, for the purposes substantially as described.

4th, The combination of the low-wine reservoir, and the condenser, or their substantial equivalents.

5th, The condenser having its bottom sunk and its top raised, in the manner and for the purpose substantially as described.

6th, The perforated disk, p.

7th, The condenser having a collar, d, essentially as described.

8th, The combination of the supply pipe, s, and cock, S, and draw-off cock, x, or their equivalents, with a condensed substantially as described.

75,471.—HOLDER FOR RAZOR STROP.—Geo. Scott, Steubenville, Ohio.

I claim, as a new article of manufacture, the razor strop, when the leather thereof is secured to the curled ends of the spring steel back, whereby said leather is prevented from slackening by stretching, and is kept in a constant state of tension, as herein shown and described.

75,472.—STOVE DRUM.—Emel Selbach, Columbus, Ohio.

I claim the pan, D, in combination with the drum, C, operating and arranged substantially as and for the purpose set forth.

75,473.—COMPOSITION CEMENT FOR PAVEMENT, ETC.—A. M. Shaw, Lebanon, N. H.

I claim a cement for pavements and flooring, roofing, and other purposes, composed of the ingredients above named, mixed, applied, and finished in the manner above described.

75,474.—FRAME FOR HOP VINE.—A. Shoemaker and W. Phelps, Conesville, N. Y.

We claim an improved hop-vine frame formed in squares of four stakes, a a, joined together at top by the cross ties, b b, in combination with the bent poles, c c, arranged as and for the purposes herein described.

75,475.—RAILROAD CHAIR.—W. S. Shotwell, Paterson, N. J.

I claim, in chairs for railroad rails, holding the rails by sheet metal presented edgewise to the rails, substantially as and in the manner herein set forth.

75,476.—RAILWAY TRUCK.—W. S. Shotwell, Paterson, N. J.

I claim, 1st, The wheels, D, with grooved periphery, in combination with shaft, B, provided with a flange or flanged collar, a, substantially as and for the purpose specified.

2d, The arrangement of the bars, H H, with the cross ties, K K, the wheels, D D, and the axles, B B, whereby I am enabled to have a double number of bearings, and to have said bearings at any desirable point between the wheels A, or outside of them if necessary, as is herein fully set forth.

75,477.—BRIDGE.—F. H. Smith, Baltimore, Md.

I claim, 1st, A bottom chord, formed of clusters of rods connected, as described, in the panels, and connected to each other through the brace blocks, by a single rod, substantially as and for the purpose specified.

2d, The combination of the clusters of rods, D, nut plates, E, single rods, G, angle blocks, B, and nuts, H, with each other, with the horizontal cross rods M, by which the two lines of clusters are connected to each other, and with the vertical rods, I, by which the bottom chord and superstructure of the bridge are connected together, substantially as herein shown and described and for the purpose set forth.

75,478.—CLOTHESPIN OR CLASP.—H. C. Smith, Dublin, Ind.

I claim the within-described clothes clasp, made of India-rubber, and having the aperture, a, side division, b, and projections, c c, substantially as and for the purpose herein specified.

75,479.—LAMP.—W. H. Smith, New York city.

I claim, 1st, The round wick tube, A, provided with a flange, K, on its outside, and a passage, B, in combination with the worm pipe, D, constructed with an inward flange at its top, substantially as herein shown and for the purposes described.

2d, Constructing the wick tube, A, with a slot, B, made in the manner and for the purpose substantially as herein shown.

3d, Providing the two openings, e and f, on the tube, M, arranged in relation to each other, substantially as and for the purpose herein set forth.

4th, The construction and arrangement of the top edge of the spiral tube, D, being below the edge of the tube, A, for the purpose of preventing the flame to reach the tube, D, and heating the burner, substantially as herein shown.

5th, The tube, F, tightly jointed, and uniting with the wick tube, A, substantially as and for the purpose herein described.

75,480.—FLY TRAP.—Albert Snyder, Jackson, Mich.

I claim the combination of the dome, A, and platform, C, with the holes, I I, disk, D, and rim, B, as and for the purpose set forth.

75,481.—HORSE HAY FORK.—Harvey B. Steele, West Winsted, Conn.

I claim the shield or scabbard, A, constructed as described, in combination with the lever, B E, connecting rod, F, and prong, G, arranged and operating substantially as and for the purposes set forth.

75,482.—PHOTOGRAPHIC PRINTING APPARATUS.—J. Stehman, Lancaster, Pa.

I claim the additional printing process, substantially in the manner specified.

75,483.—LAMP BURNER.—C. St. John, Charleston, Mass.

I claim, in combination with the wick tube applied to the capscrew or lamp body, so as to be movable vertically, relatively to the air-deflector or chimney supporter, substantially in manner as specified, the foraminous cup or guard, D, made and arranged with the chimney supporter and the air deflector, substantially as specified.

Also, the combination and arrangement of the guide, K, with the standards E E, and the chimney supporter, C, and the part, D, applied thereto as specified.

Also, the improved lamp-burner as composed of the chimney-holding springs, I I, the chimney-supporting cone and air-deflector, C, the perforated cup, D, the standards, E E, the screw cap, B, and the wick tube, A, and its guide, K, arranged as described, and having the wick movable in the cap, B, and guide, K, by means and in manner as described.

75,484.—TRUSS PAD.—Fred. A. Stohlmann, Brooklyn, N. Y.

I claim a truss pad, formed with spring-fingers, padded and attached to the truss spring, as and for the purposes set forth.

75,485.—SYRINGE.—Fred. A. Stohlmann, Brooklyn, N. Y.

I claim a syringe with a hollow piston rod, d, piston, e, screw-head or cap, b, and neck, g, as and for the purposes set forth.

75,486.—HORSE HAY FORK.—Hiram C. Stouffer and Abraham Stouffer, Bever Township, Ohio.

We claim the tines, B C, links, E D, and shaft, A, in combination with the lever, F, all constructed and arranged to operate in the manner as set forth.

75,487.—MACHINE FOR FORMING TUBULAR BEADS ON SHEET METAL GUTTERS.—O. W. Stow, Plantsville, Conn.

I claim the combination of the cam lever, F G, with the pivoted jaws, D D, whereby the jaws are closed to form the bead, substantially as described for the purpose specified.

75,488.—BOLT FASTENING.—Enoch E. Stubbs, West Elkton, Ohio.

I claim the combination of key, d, dog, a, and spring, e, with the clasp, D, and recessed bolt, A, when the several parts are constructed, arranged, and operated conjointly in the manner and for the purpose specified.

75,489.—CAR COUPLING.—A. W. Sullenberger, Laurel, Ind.

I claim, in combination with the shaft, E, segment, D, and pin, C, suspended therefrom, the yoke, B, and trigger, G, for holding the pin suspended in a vertical position and dropping it automatically, on the entrance of the link into the drawhead, substantially as described.

75,490.—SPRING BED BOTTOM.—Richard Tattershall, Beloit, Wis.

I claim the employment of the device herein described for securing the supporters, C, to the bedstead, D, as set forth.

Also, the guard bands, H, or their equivalent, in combination with the supports, C, brackets, E, locking pins, e, hooks, b, the transverse slat, I, rubber springs, B, and slats, A, when constructed and arranged substantially as herein set forth and described, for the purpose specified.

75,491.—COAL STOVE.—Jasper Van Wormer and Michael McGarvey, Albany, N. Y.

We claim, 1st, In base burning or magazine stoves, a funnel or hopper attached to or supported by the top or outside casing of the stove, in combination with the open top magazine cylinder, K, as and for the purpose set forth.

2d, The perforated check-draft plate, l, in a downward draft flue, provided with a register, R, so arranged as to pass the soot and ashes that collect upon them, through the register and plate, into the escape flue, when the register is traversed for that purpose.

75,492.—TELEGRAPH POLE.—Cromwell Fleetwood Varley, New York city.

I claim the combination of a conducting wire, running to the ground, with the telegraph pole and the insulators attached thereto, substantially as and for the purpose set forth.

75,493.—PHOTOMETER.—Dr. H. Vogel, Berlin, Prussia, assignor to Wilson & Hood, Philadelphia, Pa.

I claim, 1st, The arrangement of the transparent paper strips, C, which arranged in steps, and which are divided into sections, each section having an opaque partition, substantially as herein shown and described.

The box, A, when provided with a cover, B, having a glass plate b, and the step-formed paper, C, and with the sliding false bottom, D, pressed against the paper, C, by means of a spring, E, as set forth, all made and operating substantially as herein shown and described.

3d, The paper strips, saturated with alkaline chromate, when they are applied to a photometer, substantially as herein shown and described.

75,494.—ATTACHING HORSESHOE.—John Wagner, Washington, D. C.

I claim attaching the bands, C and D to a horseshoe, B, in the manner substantially as shown and described and for the purpose set forth.

75,495.—DEVICE FOR CONVERTING ROTARY INTO RECIPROCATING MOTION.—Eaton Walker, Dundee, Ill.

I claim the combination of the wheels, A, provided with the cams, a, the oscillating lever, D, provided with the friction rollers, I, and the arm, F, all constructed and arranged to operate substantially as described.

75,496.—VAPOR BURNER.—Thomas Ward, Columbus, Ohio.

I claim, 1st, The application of the double packing, H and I, to regulate the fluid and gas, as set forth in the above specification.

2d, The brass or metal plate, F, having the lower end formed into a cap, D attached to the burner, and its upper end bent inward toward the generating chamber, all constructed as herein shown, and arranged in relation to the aperture, g, substantially as and for the purposes set forth.

75,497.—OIL FOR PAINT, ETC.—William Ward, Cleveland, O.

I claim, 1st, The herein-described compound, consisting of the waste and linseed oil, or its equivalent, when compounded in the manner, and in any proportion, for the purpose substantially as set forth.

2d, The cement, consisting of waste, linseed oil, and lime, or its equivalents, when compounded in the manner and for the purpose substantially as described.

3d, The utilizing of the waste from the bleaching apparatus of paper mills, by compounding the said waste with linseed oil, or its equivalents, or with crude petroleum, or with its distillates; also, in compounding the same with lime in its various conditions, and with the pigments used for paint, in the manner substantially as described.

75,498.—PLANER'S CHUCK.—William H. Warren, Worcester, Mass.

I claim, 1st, The improved planer's chuck, herein described, when its several parts are constructed and arranged substantially as set forth.

2d, The sliding jaw, G, having the slotted blocks, E E, attached thereto, in combination with bed plate and set screws, all constructed as and for the purpose set forth.

3d, The subject matter of second claim, in combination with the movable pins, C C, when arranged to operate in the manner substantially as specified.

75,499.—INKING APPARATUS FOR COLOR PRINTING.—Lawrence B. Waterman, Indianapolis, Ind., assignor to John Carlton & Co.

I claim, 1st, The screw rod, D, and nuts, e e, in combination with sectional plates, c c, having slots, c' c', all combined and arranged substantially as and for the purpose set forth.

2d, The inking roller, I, provided with the removable shaft, K, working in a sliding gearing, H, in combination with the distributing roller, J, having fixed bearings, J', substantially as and for the purpose set forth.

75,500.—DEVICE FOR WEAVING CHAIR SEAT.—G. A. Watkins, Proctorsville, Vt.

I claim a needle or shuttle, of flat shape or bar form, constructed as described, to hold the splints at their one end in such a manner as that the splint may be readily detachable therefrom after it has been passed through the warp, and shaped to form a batten for beating up the filling, substantially as specified.

75,501.—CAR BRAKE.—James White and Thomas Lingle, South Amboy, N. J.

We claim, 1st, The suspended frame, C, in combination with the shaft, E, axle, A, and band, d, and the devices for preserving the tension of the band, substantially as described, for the purpose specified.

2d, The sliding clutch and sleeve, F, with brake chain, G, attached, substantially as described, for the purpose specified.

3d, In combination with the sliding clutch, the rod, e, pin, f, bell crank, g, and rod, h, substantially as described, for the purpose specified.

4th, The self-acting gage, when the same is arranged for the purposes set forth, and when consisting of the adjustable bar, j, arranged as described, in combination with the bar, e, bell crank, g, or its equivalent, and rod, h, all made and operating substantially as and for the purpose herein shown and described.

5th, The adjustable gage, j, in combination with grooved sleeve, F, and rod, e, substantially as described, for the purpose specified.

6th, The device for operating the brakes by the chain, G, said device consisting of the arrangement and combination with the lever, K, of the lever, O, having an arm, r, the sliding bar, N, spring, s, and pulleys, p p, and q, all made and operating substantially as and for the purpose herein shown and described.

7th, The lever, K, in combination with the lever, O, and chain, L, for the purpose of combining the hand brake with that which is operated from the locomotive, substantially as set forth.

8th, The ratchet wheel, k, and spring pawl, l, in combination with the sleeve, F, all constructed as described, for the purpose specified.

75,502.—BRIDGE.—T. B. White, New Brighton, Pa.

I claim the clamps and packing blocks, E F, and G, made of wrought iron, and constructed and arranged for use substantially as described, and for the purposes set forth.

75,503.—HOP DRYER.—Jonathan Whitney, Fort Winnebago, Wis.

I claim, 1st, A hop dryer, consisting of a drying room, E, and store room F, and provided with a curbed frame, B, having tilting drying floors, mounted on a track, D, all constructed and arranged to operate substantially as described, and for the purpose set forth.

2d, The curbed frame, B, and tilting drying floors, A, constructed and arranged to operate substantially as described, and for the purpose set forth.

75,504.—PAVEMENT.—C. Williams, New York city.

I claim the construction and arrangement in a wooden pavement of the blocks, A A, in such a manner that double dovetailed grooves shall be formed between said blocks, so that when the same are filled with cement, as herein described, such filling will operate as a tie to said blocks, substantially as set forth.

75,505.—WATCH CASE.—Gile J. Willson, Reading, Pa.

I claim, 1st, The application of a separate entire ring to the center of an ordinary watch case, new or old, which the movement of the watch will connect with, in the manner set forth, made of any convenient material, and of any size, shape, or form, to answer the purposes set forth.

2d, The application of a conical pointed tube, with its bearing or packing on the movement of a watch or some elastic substance, and connected with the cap of the watch in any convenient manner, to answer the purposes set forth.

75,506.—DOVETAIL MACHINE.—Robert Wolf, Burlington, Iowa.

I claim, 1st, The combination of the cam, F, and jointed lever, G, with the fork, f, pin, g, and carriage, I, all made and operating so that a suitable oscillating motion is imparted to the carriage, I, substantially as and for the purpose herein shown and described.

2d, The longitudinally movable frame, H, in combination with the oscillating carriage, I, and laterally movable bed, J, all made as described, and and operating with the saw, E, substantially as and for the purpose herein shown and described.

3d, The combination of the lever, K, pawl, j, slotted adjustable pawl, k, spring catch, l, and bed, D, all constructed, arranged, and operating substantially as described.

4th, The combination of the oscillating plate, P, slide, n, levers, M O, and chisel, N, substantially as described for the purpose specified.

5th, The levers, o M, and chisel, N, in combination with the cam, L, operating substantially as described, for the purpose specified.

6th, The combination of the bed, T, tripping levers, b' c', sliding rack, U, and the slide, V, constructed and operating substantially as described, for the purpose specified.

REISSUES.

2,891.—FOLDING CHAIR.—Benjamin J. Harrison, and James Condie, New York city. Patented July 17, 1866.

We claim, 1st, The pair of legs, A, connected by the seat rail, b, at their upper ends, and by the rail, a, near their lower ends, in combination with the pair of legs, B, pivoted at c, to the legs, A, and united only at their upper ends at the seat rail, C, as specified, so that the rail, b, can pass entirely through, beneath the rail, C, when the legs are folded, as set forth.

2d, The seat rail, C, into which the side pieces or arms, E, of the back are framed, and extended through to the bar, G, in combination with the tie bolt, c, that connects the legs, A, and forms the axis on which the back E F swings, substantially as specified.

3d, Connecting the frame forming the back to the folding legs by a riveted bar or pivots above the point at which the flexible seat is united to the back seat rail, substantially as set forth, so that the flexible seat maintains the back in an upright position.

2,892.—BASKET.—Lansing Marble and Townsend North, Vassar, Mich., assignees of Lansing Marble. Patented Jan. 7, 1862.

We claim, 1st, A basket formed of two series of overlapping splints, A A', substantially as described, and fastened in any suitable manner.

2d, In combination with the above, the hoops, a a D and G G, substantially as and for the purpose specified.

2,893.—HYDROCARBON VAPOR APPARATUS.—F. S. Pease, Buffalo, N. Y. Patented March 13, 1860.

I claim, 1st, The combination of the box, A, one or more pans, B, for containing hydrocarbon liquid, the supply pipe, C, at or near the top, the exit pipe, D, at or near the bottom, and the condenser, E, the whole operating substantially as and for the purposes herein set forth.

2d, Condenser, employed in connection with an air carbureting apparatus, substantially as and for the purposes set forth.

3d, The combinatoin with the pans or trays B, of the perforated plates b, through which the air passes in its course through the carbureting chamber.

2,894.—FRUIT BOX OR BASKET.—Jabez W. Hayes, Newark, N. J. Patented Aug. 12, 1856.

I claim, 1st, A box or basket formed of veneers or laminæ of wood, laid across each other and turned up to form the sides, so that the bottom is made of two thicknesses, secured together substantially as specified, and the sides of single thicknesses.

2d, A box or basket formed of veneers of laminæ of wood, crossing each other at the bottom and turned up to form the sides, in combination with a cord, or its equivalent, passing around the sides to hold them together, substantially as set forth.

3d, A box or basket in which on laminæ of woods forms, two of the sides and one thickness of the double bottom, substantially as set forth.

2,895.—COAL STOVE.—J. J. Savage, Troy, N. Y. Patented Feb. 12, 1867. Division B.

I claim, 1st, Constructing a heating stove with its fuel doorway or aperture B, below and forward of its flame or combustion chamber and contiguous to or adjoining its fire box A, in manner substantially as and for the purposes herein set forth.

2d, The combination of the fuel doorway or aperture B, and fire box A, extended contiguously thereunder, as applied to heating stoves in manner substantially as and for the purposes set forth.

3d, A combination with a heating stove having its fuel doorway in the position as herein described, the employment therewith of a lifting lever F, substantially in manner as and for the purposes herein set forth.

4th, In a heating stove, in combination with its fire box back lining plates and its fuel doorway or aperture B, the arrangement of a front lining plate E, in position between the flame chamber C, and the said fuel aperture, in manner substantially as and for the purpose set forth.

5th, In combination with a lever lifter F, as applied to heating stoves in manner as herein described, the employment of a holding hook b, and catch ridge e, substantially as and for the purpose set forth.

6th, A heating stove so constructed that fresh fuel may be cast or fed directly into vacant room or open places, previously formed or made for it in, below, and between the ignited fuel or coke, within the fire box of said stove, by the means and operation in manner substantially as hereinbefore fully described and shown, for the purposes as set forth.

2,896.—TRELLIS FOR STRAWBERRY AND OTHER PLANTS.—Wm. W. Wilcox, Middletown, Conn. Patented Aug. 27, 1867.

I claim a trellis, a, made substantially as described, with an upright post or posts, e, and branching arms, c, or their equivalent.

DESIGNS.

2,947.—HOOP SKIRT.—Charles S. Chaffee and Charles H. Vandercook, Birmingham, Conn.

2,948.—AX LABEL.—James H. Mann, Lewistown, Pa.

2,949.—REED ORGAN CASE.—John Schatz, New Haven, Conn.

2,950.—TRADE MARK.—Junius Schenck, New York city.

PENDING APPLICATIONS FOR REISSUES.

Application has been made to the Commissioner of Patents for the Reissue of the following Patents, with new claims as subjoined. Parties who desire to oppose the grant of any of these reissues should immediately address MUNN & CO., *37 Park Row, N. Y.*

[ISSUED FOR WEEK ENDING TUESDAY, MARCH 3, 1868.]

20,647.—GANG PLOW.—Don Carlos Matteson, Stockton, Cal. Dated June 22, 1858. Application for reissue received and filed February 24, 1868.

I claim the arrangement as described, of the false beam, N, goose neck, G, axle, n, lever, l, catch, L, and the system of plows, attached to their frame as set forth, the whole being constructed and operating substantially as and for the purposes specified.

I further claim the gage wheels and irons, v v, and the axles, w, arranged substantially in the manner as and for the purpose set forth.

19,896.—LAMP.—P. Hannay, Washington, D. C., and Hudson Taylor, Poughkeepsie, N. Y., assignees by mesne assignments of Pascal Plant, Washington, D. C. Dated April 6, 1858. Application for reissue received and filed February 28, 1868.—Division A.

1st, I claim causing a current of air to impinge upon or commingle with the lower or blue part of the flame of a hydro-carbon lamp, through the instrumentality of a cap piece or burner, without the aid of a chimney, substantially as described.

2d, A cap piece or burner, combined with and applied to a hydro-carbon lamp, for the purpose of producing combustion without the aid of a chimney, substantially as described.

3d, Making the cap piece or burner adjustable, relatively, to the wick and wick tube, substantially as described.

19,896.—LAMP.—P. Hannay, Washington, D. C., and Hudson Taylor, Poughkeepsie, N. Y., assignees by mesne assignments of Pascal Plant, Washington, D. C. Dated April 6, 1858. Application for reissue received and filed February 28, 1868.—Division B.

1st, I claim combining the cap piece or burner, with the wick tube, or lamptop of a hydro-carbon lamp, in such manner that the burner may be thrown back from the wick tube, substantially as and for the purposes described.

2d, The combination of a hinged cap piece, or burner, with the means of adjusting the same relatively to the wick tube, substantially as described.

3d, A hinged burner, or cap piece, for a hydro-carbon lamp, substantially as described.

65,168.—VEHICLE.—The American Hard Rubber Wagon Company, New York city, assignees by mesne assignments of John S. Campbell, Newton, N. J. Dated May 28, 1867. Application for reissue received and filed February 28, 1868.—Division A.

We claim, 1st, The bodies of vehicles constructed wholly or in part of india rubber or other plastic material, substantially in the manner herein set forth as a new article of manufacture.

2d, The arrangement of the flanges, b and c, and cross pieces, d, or either of them, in the bodies of vehicles made from india-rubber or other plastic material, substantially as and for the purpose described.

65,168.—VEHICLE.—The American Hard Rubber Wagon Company, New York city, assignee by mesne assignments of John S. Campbell, Newton, N. J. Dated May 28, 1867. Application for reissue received and filed February 28, 1868.—Division B.

We claim the running gear of vehicles constructed of india rubber or other plastic material, substantially in the manner described, as a new article of manufacture.

65,168.—VEHICLE.—The American Hard Rubber Wagon Company, New York city, assignees by mesne assignments of John S. Campbell, Newton, N. J. Dated May 28, 1867. Application for reissue received and filed February 28, 1868.—Division C.

We claim the running gear of vehicles constructed of india rubber or other plastic material, substantially as herein set forth as a new article of manufacture.

65,168.—VEHICLE.—The American Hard Rubber Wagon Company, New York city, assignees by mesne assignments of John S. Campbell, Newton, N. J. Dated May 28, 1867. Application for reissue received and filed February 28, 1868.—Division D.

We claim the dash boards of vehicles constructed from india rubber or other plastic material, substantially in the manner herein set forth as a new article of manufacture, whether the dash board be provided with the iron frame or parts thereof or not.

25,209.—ARGAND GAS BURNER.—M. H. Collins, Chelsea, Mass., assignee by mesne assignments of Hippolyte Monier, Paris, France. Dated August 28, 1859. Application for reissue received and filed February 25, 1868.—Division A.

I claim, 1st, The construction of the argand burner, with its grate, a, and external tube, b, of clay, porcelain, or other incorrosible, refractory nonconducting material, and with its inner tube and stem of metal, the several parts being combined substantially as herein described.

2d, Combining with the chimney and the base on which it rests, elastic internal supports, g g, inclined outwardly from the top towards the bottom, and bearing against the inner surface of the chimney above its base, substantially as and for the purpose set forth.

25,209.—ARGAND GAS BURNER.—M. H. Collins, Chelsea, Mass., assignee by mesne assignments of Hippolyte Monier, Paris, France. Dated August 28, 1859. Application for reissue received and filed February 25, 1868.—Division B.

I claim the glass chimney of an argand or other burner, constructed without a flange upon its base, and having the lower portion cylindrical, and the upper part tapering towards the top, substantially as described.

63,486.—SAW.—Henry Disston (assignee of Charles Disston), Philadelphia, Pa. Dated April 2, 1867. Application for reissue received and filed February 28, 1868.

I claim, 1st, A projection, b, on a detachable saw tooth, having a circular base, adapted to a corresponding recess in the blade, in combination with a shoulder, f, on the latter, against which the said projection may be brought to bear by partly turning the tooth in the recess of the blade, all substantially as and for the purpose herein set forth

2d, The lips, l, on the edge of the projection, d, of a saw tooth, or on the edge of a recess in the blade, in combination with a groove and recess, m, in the projection or in the blade, substantially as specified.

69,344.—SAD IRON.—A. Y. Hubbell, Elmira, N. Y. Dated October 1, 1867. Application for reissue received and filed Feb. 29, 1868.

I claim the parts, A B, arranged in combination with a non-conducting substance, an air chamber or vacuum, substantially as set forth and described.

65,580.—MEDICAL PREPARATION.—Charles L. Lege, San Antonio, Texas. Dated June 11, 1867. Application for reissue received and filed February 29, 1868.

I claim a medicament produced from the material specified.

44,964.—CLOTHES DRYER.—Lorenzo Ling, Pulaski, N. Y. Dated November 8, 1864. Application for reissue received and filed February 29, 1868.

I claim, 1st, The independently pivoted arms, B, fitted in the head, A, when used in connection with suitable automatic locks or fastenings for the purpose specified.

2d, The sides, C, on the arms, B, provided with the recesses, f, in combination with the points or spurs, e, at the ends of the flanges, a, of the head, A, and the shoulders, g, on the upper edges of said flanges, all arranged substantially as and for the purpose herein set forth.

3d, The employment or use of lines, D, one or more, when applied to the bars, B, to serve as braces or stays, for the same, substantially as shown and described.

67,460.—LUBRICATOR.—G. Waters, Cincinnati, Ohio. Dated August 6, 1867. Application for reissue received and filed Feb. 7, 1868.

The detachable combined glass reservoir and stem, A a, having a single aperture so large as to admit of easy filling by "pouring," and at the same time so small as to prevent the discharge of the oil by its own gravity, substantially as hereinbefore described, for the purposes set forth.

Also, the combined tube and socket, D C, when made out of a single piece of cast metal, substantially as described and used, in combination with a glass reservoir.

Also, a lubricator, consisting of a glass reservoir, A, attached to the tube, D, by means of the socket, C, and elastic packing, B, as and for the purposes described.

☞ NOTE.—*The above claims for Reissue are now pending before the Patent Office and will not be officially passed upon until the expiration of 30 days from the date of filing the application. All persons who desire to oppose the grant of any of these claims should make immediate application.* MUNN & CO., *Solicitors of Patents, 37 Park Row, N. Y.*

Inventions Patented in England by Americans.

[Compiled from the "Journal of the Commissioners of Patents."]

PROVISIONAL PROTECTION FOR SIX MONTHS.

385.—BOILER ALARM.—Thomas P. Akers, New York city. Feb. 4, 1868.

395.—BUTTONS, AND MEANS FOR SECURING THEM TO GARMENTS.—Daniel McL. Somers and Walter S. Atwood, Brooklyn, N. Y. Feb. 5, 1868.

405.—STEAM GAGE.—David M. Greene, Troy, N. Y. Feb. 6, 1868.

408.—SEWING MACHINE.—Thos. A. Macaulay, New York city. Feb. 6, 1868.

422.—LOCK.—Charles H. Eiffler, New York city. Feb. 7, 1868.

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